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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.

EDITED BY  
  
THE HONORARY SECRETARIES.

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JANUARY TO DECEMBER,  
1880.

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CALCUTTA:  
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84

## CONTENTS.

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	<i>Page</i>
Proceedings for January 1880 .....	1-20
Do. for February, including Annual Report .....	21-48
Do. for March, 1880 .....	49-68
Do. for April, „ .....	69-84
Do. for May, „ .....	85-98
Do. for June, „ .....	99-112
Do. for July, „ .....	113-138
Do. for August, „ .....	139-166
Do. for November, „ .....	167-194
Do. for December, „ .....	195-206
Index .....	207-222
List of Members of the Asiatic Society of Bengal on the 31st December, 1879, Appendix to February Proceedings .....	i
Abstract Statement of Receipts and Disbursements of the Asiatic Society of Bengal for the year 1879, Appendix to July Proceedings .....	xvii

---

## LIST OF PLATES.

---

- I. Diagrams to illustrate the Use of Silver Films in Improved Instruments of the Camera Lucida Class (p. 75).
- II, III. Drawings of Hailstones (p. 103).
- IV, V, VI, VII. Inscriptions from Sylhet (p. 141).
- VIII. Inscription from Buddha Gaya (p. 172).
- IX. Palæolithic Celt from Thandiani (p. 175).
- X. Map of the Eastern Frontier of Thibet (p. 196).

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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL,  
FOR JANUARY, 1880.

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The monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 7th instant, at 9 o'clock P. M.

H. B. MEDLICOTT, Esq., M. A., F. R. S., President, in the Chair.

The minutes of the last Meeting were read and confirmed:—

The following presentations made since last meeting were laid on the Table—

1. From the Government of India, Home, Revenue and Agricultural Department,—Scientific Results of the Second Yarkand Mission; (1) *Syringosphæridæ*, by Professor P. M. Duncan, and (2) *Lepidoptera*, by F. Moore.

2. From the Author,—Note on Elephants (supplementary to that of the 3rd April 1879); by Captain H. W. Clarke.

3. From the Cherbourg Society of Natural Science,—Catalogue of their Library, Part II; by Aug. le Jolis.

4. From the Zoological Society of London,—List of the Vertebrate Animals now or lately living in the Gardens of the Zoological Society of London. Seventh Edition.

5. From the Author,—Metrical Translations from Sanskrit Writers; by J. Muir.

6. From the Superintendent, Marine Surveys,—(1) Chart of the Mutlah River to the Chittagong Coast, (2) Chart of Tuticorin Roadstead and Harbour.

7. From Die Verein für Naturkunde in Cassel,—Catalogue of their Library.

8. From Dr. G. Leitner,—Proceedings of the Anjuman-i-Punjab in connexion with the proposed Vaccination Bill and Dr. Cunningham's Sanitary Primer.

9. From the Royal Zoological Society of Amsterdam,—A number of their publications, the names of which will be found in the Library List.

10. From the Madras Government, Education Department,—A Classified Index to the Sanskrit MSS. in the Palace at Tanjore; by A. C. Burnell.

11. From the königliche bayerische Akademie der Wissenschaften in München,—Ueber Calderons Sibylle des Orients; by W. Meyer.

The following gentlemen, duly proposed and seconded at the last Meeting, were ballotted for and elected Ordinary Members—

Fred. E. Pargiter, Esq., B. A., C. S.

Lieut. W. H. Johnstone, R. E.

Bábu Govinda Kumara Chaudhuri (re-election).

H. Kisch, Esq., C. S.

J. W. Parry, Esq.

The following Gentlemen were announced as candidates for ballot at the next meeting—

1. Beharilal Gupta, Esq., B. C. S., proposed by Dr. Rájendralála Mitra, seconded by Bábu P. C. Ghosha.

2. The Hon'ble Arthur Wilson, proposed by H. B. Medlicott, Esq., seconded by J. Crawford, Esq.

The SECRETARY reported that Mr. R. Parry had intimated his desire to withdraw from the Society.

The SECRETARY announced that a limited number of coloured copies of Messrs. Moore and Hewitson's "Descriptions of new Indian Lepidoptera in the collection of the late Mr. W. S. Atkinson" were available for sale to Members at Rs. 4-8 per copy and to Non-Subscribers at Rs. 6 per copy.

With reference to the Ethnological Queries put by Professor Schaffhausen of Bonn to Mr. H. Rivett-Carnac, and which were published in the August Proceedings, the Secretary read a letter from Mr. W. King, dated 9th December, in which he says:

I have just seen in the Proceedings, Asiatic Society of Bengal for August 1879, the series of questions put to Mr. H. Rivett-Carnac by Professor Schaffhausen of Bonn.

Perhaps it may not be too late to let it be known that I saw two Yanádi men (of an aboriginal tribe living about Sriharikota and the Palicah Lake) produce fire from the friction of wood in (I think) 1862. It was a rainy day, and within a short distance of a village whence fire could easily have been found: yet these men worked industriously for

about half an hour until the fire was produced. The man sat on his haunches, with a small horizontal bar of wood, kept in its place underneath his feet. There was a small hole made or worn in this bar, and in this was inserted the point of a vertical stick which the men alternately rolled between the palms of their hands. Under this rapid friction of the vertical stick in the small hole in the horizontal one carbonized dust gradually collected, when at last a first spark of fire was produced which the men gently blew into a flame around a piece of rag which they held close to the bit of carbonized dust. I neglected to ascertain the kinds of wood used; but the men had evidently had them for some time in their possession.

The PRESIDENT exhibited some Geological Specimens from Afghánistán and said—

At the June and August meetings of the Society specimens were exhibited from the hills between Dera Ghází Khán and the Pishin Valley, on the Thal Chotiáli route, passing north of Quetta. The presence of bitumen and nummulitic rocks was proved; and there were no specimens that might not belong to these formations. There were also many samples of baser irruptive rocks, and some partially metamorphosed rocks, but which may only be connected with the contact of the trappean masses.

The collections now to be noticed are from the region of the Safed Koh. There are 12 specimens sent by Major Tanner from the north or Gandamak side of the range, and three by Mr. Scott from the same ground, one being from the summit of Sikarám the highest peak (15,620 feet) of the range. Both of these contributors are officers of the Topographical Survey. A larger collection, numbering some 40 specimens, was made by Dr. J. E. Tierney Aicheson, attached as botanist to the Kuram column; these are from the southern or Peiwar Kotal flanks of Sikarám. The two latter collections were communicated through Mr. A. B. Wynne, of the Geological Survey.

From all these specimens we soon form a rough idea of the geology of the ground. The ridge of the Safed Koh at Sikarám, and all the country to the north seems to be formed of much altered rocks, though with only few samples of the extreme gneissic type. There is a remarkable preponderance (as represented by these specimens) of magnesian and calcareous rocks; amongst them come very fine white montitis and stratitis. The culminating point of the Safed Koh is approximately formed of pure white quartzite, but the range most likely owes its name to its snow beds. The white rock from which Safed Sang takes its name is a beautiful statuary marble.

On the western flanks of Sikarām, at elevations of 10,000 feet, quite unaltered shales, with impressions of Algæ, and similar rocks from the south side, occur among Dr. Aicheson's specimens. There are no observations to suggest what may be the stratigraphical solutions of these highly contracting series of rocks. The only clue as to age for any of these formations is in a large pebble of limestone found in the Shalinar stream on the east side of the Peiwar Kotal; it is a lithodendroid coral, testifying to the presence of triassic or carboniferous strata in the vicinity.

A serpentinous trapean rock or diallagic serpentine seems to be in force about Ali Khel.

Beside these, Dr. Aicheson brought to notice a copper ore found on Karâtiza hill, near the Shuturgardan. It was forwarded officially for opinion, the presence of some metallic copper having given rise to the impression that the ore was peculiarly rich. This was not confirmed by analysis; the total yield of metal being only 26 per cent. It is a very mixed ore, with much silicious matter finely disseminated.

From the northern side of the range, again, specimens were sent by Major Stewart, of the Corps of Guides, from the so-called ruby-mine near Jagdalak. It appears that the gems found there were highly prized by the natives, a guard being kept constantly at the mine by the Amir, and it was naturally thought that it might prove a source of revenue. However this may be, it is certain that the gem is not the true ruby, but only spinel-ruby, which is very little thought of in Europe, its value being not more than a tenth that of the true oriental ruby, or red sapphire. The spinel can generally be most readily distinguished by its carmine-red colour and its crystalline form, in regular octahedrons, as is well seen in the specimens furnished by Major Stewart. A good specimen of the rock in which it occurs was also sent; it is a largely crystalline micaceous limestone.

I have also laid on the table a specimen of beautiful verdeantique marble, or calcareous serpentine, brought by Major Biddulph from Shigar in Ladakh where it is continuously worked and sold as "yessham" or jade.

Dr. RĀJENDRALĀLA MITRA exhibited some very old palm-leaf MSS. and some ancient coins.

Dr. Mitra said that, in his paper on the Pāla and the Sena Rājās of Bengal, he had occasion to advert to the era of Lakshmaṇa Sena, and to refer to certain Sanskrit MSS. which were dated in that era. He had since been able to obtain some MSS. of the kind as also some others of very old dates. These he submitted as proofs of the era in question having been current all along from the time of its initiation to a very recent date. The codices were written with ink on palm-leaf (*Corypha elata*), and appeared very much decayed and crumbling; but the writing was clear and fairly

correct. One of the MSS. was dated the 6th of Śrāvana ১৫১৫ 1509, but the cypher was obviously a mistake, for 1509, would make it correspond with A. D. 2614, which would be absurd. Nor is the mistake an uncommon one; ignorant copyists very often put in a dot to indicate hundred and then put in the unit, though correctly in the decimal system the unit figure should occupy the place of the dot. Dr. Mitra had seen many instances of the kind in the pagination of MSS. Taking the date at 159 of the Lakshmaṇa era it would correspond with 1265 of the Christian year, and the MS. would consequently be 615 years old. That would make it the oldest Bengali record that had yet been discovered. The place where the

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*Proceedings, January 1880.*

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Page 3, line 16, for bitumen	read cretaceous.
„ 3, „ 18, „ baser	„ basic.
„ 3, „ 31, „ soon	„ can.
„ 3, „ 33, „ seems	„ seem.
„ 3, „ 36, „ come	„ some.
„ 3, „ 36, „ montitis	„ marbles.
„ 3, „ 36, „ stratitis	„ steatites.
„ 3, „ 37, „ approximately	„ appropriately.
„ 4, „ 4, „ solutions	„ relations.
„ 4, „ 5, „ contracting	„ contrasting.
„ 4, „ 12, „ Karatiza	„ Karatiga
„ 4, „ 31, „ continuously	„ extensively.

and bore date Saka 1417 = A. D. 1499, which gives it an age of 383 years. It is a work of considerable repute, but exceedingly rare. The last was the *Súdrapaddhati* of Apipála, written in the Samvat year 1442 = A. D. 1385, *i. e.*, 495 years ago. Dr. Mitra had not seen the work cited in current digests on the religious duties of the Súdras of which it treats, but it appears to be a very comprehensive and well-written summary of all the laws current on the subject.

Dr. Mitra also exhibited a small collection of coins lately obtained by him from money-changers at Bombay. It included an Egyptian gold-piece of 1277 H.; 10 and 20 cent pieces of Hongkong, Italy, Mauritius, France, Spain and Mexico; a 5-Frank piece of Napoleon I, (1812); a 50-Lepta of Greece; a 50-Koptek of Austria; a  $\frac{1}{4}$  guilder of Netherlands India; and rupees of most of the native States of India. Of old coins there were two good rupees of Muhammad bin-Tughlak; several Bull and Horsemen tankás of Chahāḍa Deva, Syalapati Deva, and Shams-uddīn Altinish; half a dozen specimens of the silver currency of the Khálifs; of several Sassanians; and



some Parthians. Among the last were drachmas of Arsaces Artabanus, and Arsaces Sinatroces. Of the former there were four specimens with the legend in perfect preservation thus—*βασιλεὺς βασιλεὺν ἀρσικὸν Δικαίου ενεργετοῦ ἐπιφανίου φιλελλιχός*, with the monogram  $\bar{A}$  under the extended bow of the king. Of the latter there was an only specimen and one word in its legend was illegible. It had no monogram. Its legend runs thus—*βασιλεὺς Μεγάλου ἀρσικὸν φιλοπατροῦ* — *ἐπιφανίου φιλελλιχός*.

Mr. H. F. BLANFORD exhibited an actinometer of a new form, the invention of Professor Balfour Stewart, recently constructed for the Alipore Observatory. Also the older forms of actinometer invented by Herschell, Pouillet (the Pyrheliometer) and Hodgkinson, and described the object and principle of these instruments.

An actinometer is essentially a thermometer, having in general a large bulb and a very contracted column; and its object is to measure the quantity of heat, (or, to speak more strictly, the radiation) received from the Sun in a certain definite interval of time (which may be half a minute or more) by observing the expansion thereby produced, which is a function of the quantity of heat received, and the mass and nature of the fluid heated. An ideally perfect actinometer would be one which should completely absorb and convert into heat all the radiation which falls on its exposed surface, while it should remain entirely unaffected by radiation to or from bodies around, other than the Sun, and by any change of temperature in the air or other medium in contact with it. But this, of course, cannot be realized.

In Professor Balfour Stewart's actinometer, the disturbing influences are reduced to a minimum, so far as is compatible with simplicity of arrangement and working. The thermometer which is mercurial, having a bulb of about the size and form of a walnut, is enclosed in a massive hollow cube of brass, perforated by a small hole in the middle of one side, which can be closed by a sliding screen, and through which a beam of the sun's rays concentrated to a focus by a lens  $2\frac{1}{2}$  inches in diameter is directed on the thermometer bulb. With the exception of this small aperture, a massive brass wall blackened internally completely surrounds the thermometer and screens it from the variable radiation of surrounding objects, and the chamber itself is also protected by a casing of felt and an outer coating of polished brass plates. The instrument is mounted on a massive iron stand affording a motion both in azimuth and altitude. In use the instrument possesses the great advantage of simplicity over all other forms of actinometer. Having been placed in position, so that the Sun's image in the focus of the lens falls on the shutter immediately over the aperture already noticed, the shutter is withdrawn, and the concentrated beam allowed to fall on the thermometer bulb during the

space of two minutes by the chronometer ; the temperature being observed at the instant of withdrawing the screen and again on closing it. There is, of course, an unknown loss of heat by absorption in the lens and reflection from its surface, so that the measurement obtained is only a relative and not an absolute determination, but the same must be said of other forms of actinometer, and meanwhile an instrument that affords a good relative measurement and is so simple in manipulation is a very important addition to our means of observation.

Dr. HOERNLE exhibited 10 copper coins of the Mitra dynasty, kindly sent by Mr. H. Rivett-Carnac, for the inspection of the Society. In a note accompanying the coins, Mr. Rivett-Carnac says, that he obtained them through Mr. H. Pratt from the vicinity of Rámnagar, in the Bareilly District, and that Mr. A. C. Carlleyle, of the Archæological Survey, to whom he sent them for inspection, read the legends and, at his request, prepared a detailed description of the coins, to be read before the Society. The description is entitled—

*Coins of the Sunga or Mitra Dynasty found at Rámnagar or Ahichhatra, the ancient Capital of North Panchála in Rohilkhand ; the property of H. RIVETT-CARNAC, ESQ., C. I. E., F. S. A., &c. Described by A. C. CARLLEYLE, of the Archæological Survey of India.*

(Abstract.)

After some introductory remarks on the wide extent of the sway of the Mitra dynasty, the author mentions that he himself obtained a considerable number of these coins from excavations at Bhuila, the site of the ancient city of Kapilavastu, in the Basti District ; but the coins obtained by Mr. Rivett-Carnac (about 110) are mostly of a much larger size, and several bear names of kings which are either new or of rare occurrence ; such as Bhadraghosa, Phaguni-mitra, Srayañ-mitra and Anu-mitra. Taking into account the numerical proportion, in which the coins of the various kings were found in the hoard, as well as the older or later form of the alphabetic characters of the legends and some other peculiarities, the author proceeds to arrange the coins in the following chronological order: 1, Bhadraghosa (5 coins), 2, Srayañ-mitra (7) ; 3, Bhanu-mitra (10); 4, Agni-mitra (11); 5, Anu-mitra (1); 6, Phaguni-mitra (28); 7, Bhúmi-mitra (34); 8, Indra-mitra (2). The impressions on these coins are very much alike. The Obverse always shows a square depression, caused by a die, containing the legend (the mere name of the king in the genitive case), with three symbols above, arranged in a horizontal row. These symbols are said to be the Bodhi-tree, Linga and two serpents entwined. The Reverse shows

either a figure of Buddha as teacher, or the Buddhist symbols of the "San-gha" and the Law (a wheel).

This paper will be published in the Journal, Part I.

Dr. Hoernle stated that he had shown the coins to General Cunningham, who had empowered him to communicate to the meeting that while generally agreeing to Mr. Carlleyle's description of the coins, he took exception to two of his readings. Instead of Sraya-mitra and Anu-mitra, as read by Mr. Carlleyle, he thought the names were Súra-mitra\* and Ayu-mitra. Dr. Hoernle also gave some account of what was hitherto known about the Mitra-Dynasty from Sanskrit sources, especially the Vishnu Purána and the Malavikágni-mitra; pointing out the wide divergence between names of the Mitra kings as found on the coins and as handed down in those Sanskrit works. He added that the first coin of these kings (one of Agni-mitra) was noticed by General Cunningham, as far back as 1852 (see Lassen, Ind. Ant. II, 47). Since then coins of this dynasty had been found from time to time; and General Cunningham had told him, that he possessed a considerable number of coins of Indra-mitra, who is placed at the bottom of his list by Mr. Carlleyle on account of the paucity of his coins.

Dr. Rájendralála Mitra said, the coins laid on the table were very interesting, and the acknowledgements of numismatists were due to Mr. Rivett-Carnac for the opportunity he had given them of examining the coins. The first to notice a Mitra coin was the distinguished antiquarian General Cunningham, and Sir Edward Bayley subsequently got two or three specimens; but so large a collection as that of Mr. Rivett-Carnac had never before come to notice. It supplied many links, hitherto missing, of a dynasty which was known only from casual mention of two or three names in Puráṇas and works of fiction, like the 'Málaviká Agnimitra,' and the time, he hoped, would soon come when the chronology of the dynasty would be settled satisfactorily. He took exception, however, to the classification which had been adopted by the author of the paper read, and to the principle on which that classification had been based. The principle was an arithmetical one, and priority and posteriority were regulated by the number of coins found in the trove. That king who was represented by a single specimen of his coinage was accepted as the oldest; he was reckoned the second, two of whose coins had come to hand; and the largest number of coins represented the latest king. Dr. Mitra thought this principle to be a fallacious one, calculated to mislead at every step. A hundred different circumstances might lead to a trove containing more coins of one reign than of another, without any reference to their age. To take an instance ready at

\* In a communication from Mr. Carlleyle, received after the meeting, he says, that he now also reads the name Súra-mitra.

hand, he said, the packet of miscellaneous coins he had laid on the table contained one coin each of Victoria and Isabella—a 20-cent piece of Mauritius and a 40-cent piece of Spain,—and five coins of the Arsacidan dynasty, and six of the Sassanians. Were the packet treated as a trove, or to become a trove under some circumstance or other, the principle, faithfully worked out, without reference to history, would result in the conclusion that the Queen-Empress Victoria and Isabella were the oldest, that the Parthians were much later than these, and that the Sassanians were the most recent. A principle that would lead to such a conclusion was open to the gravest objection. The author of the paper had himself felt this objection, and had met it by adding that he had supplemented it by his knowledge of the gradual changes which the Laṭ character had undergone in course of time. Dr. Mitra took exception to this also, for he thought no one, however well-versed he may be in the old character, could, from the appearance of three or four smudgy letters on two coins, say which was the anterior and which the posterior. The total number of Laṭ inscriptions was so exceedingly limited that it was impossible from a study of them to acquire such a test of the gradual changes which letters undergo in course of time as would suffice to determine the difference in the writing of two consecutive reigns. The coins were all of copper, bearing letters varying from one-tenth to one-twentieth of an inch in size, more or less covered with rust, and otherwise defaced; the coin of the so-called Anu Mitra was the smallest, and the letters on it were one-twentieth of an inch in size, and to attempt to judge of palæographic changes from them was simply impossible. With far ampler means and opportunities, one in a hundred well-educated persons, would not venture to determine the difference in the shape of the letters forming the words ONE RUPEE on the coins of William IV and Victoria. Dr. Mitra had seen only the coins laid on the table, and in them he could trace no such palæographic difference as would justify him in arranging them chronologically.

Dr. Mitra also took exception to the reading of two of the names. One of these he had communicated to General Cunningham whose revised reading had been announced by the Society. The other was that of Anu Mitra, which he read Bhānu Mitra. The letter *a* in the Laṭ character was very like the English K reversed thus  $\text{X}$ , with the projecting arms slightly curved, and the *bh* was like the same English letter with the upper arm removed. Now, among Mr. Rivett-Carnac's coins there was one which was unquestionably of Bhānu Mitra, and in the other which Mr. Carlleyle took for Anu Mitra, the upper part of the first letter was smudgy and covered with rust, and only the lower part was clear, and from that no one could fairly restore the upper part, and make a new name of it.\*

\* Examined with a high-power magnifying glass a few granulations appeared be-

Dr. Hoernle said, that he quite agreed with Dr. Mitra, that the principle of determining the chronology of the dynasty by the numerical proportion of their coins in a particular hoard, which Mr. Carlleyle had put forward, was not a very safe one. It certainly required to be worked with very great care; and many other circumstances also would have to be taken into account, in order to control the results obtained by the application of that principle. Mr. Carlleyle himself, however, admitted as much in his paper. In the case of the supposed hoard containing coins of Queen Victoria of England, Queen Isabella of Spain, and of the Arsacidan and Sassanian Dynasties, there would be no difficulty for numismatists to determine the relative age of the dynasties by other considerations, quite independent of such a trivial circumstance as the numerical proportion of the coins in the hoard. But when it was the case of a single dynasty, the reigns of which did not range over much more than a century and about which as yet so little was known historically, every circumstance, however trivial it might be, was of importance; though no doubt sufficient judgment and discrimination, as Mr. Carlleyle said, would have to be used to apportion to each circumstance its relative importance. Mr. Carlleyle's chronological arrangement could only be looked upon as a provisional one, which would have to be verified or modified by information derived from coins found in other hoards. With regard to the reading Bhánumitra (instead of Anumitra), proposed by Dr. Mitra, Dr. Hoernle stated that he had carefully examined the coin, which happened to be one of the best preserved of the collection, and he fully concurred with General Cunningham in his reading of the first letter as *a* (not *bh*); the upper arm of the letter being quite distinctly visible to his eye.

The coin in question was handed round and several who were present stated that they could recognize the upper arm of the letter.

A letter was read from Lieut. R. C. Temple on an Inscription at Sultánpúr in Kulu-Elí in which he writes:

"I see a translation of the Nirmand Inscription in Kulu by Dr. R. Mitra in the August Proceedings of this Society. I got a copy of it myself about 1½ years ago and sent it to Dr. Burnell, but do not know what has happened to it since. There is another Kulu Inscription which it might be worth while copying and translating. It is in the Chaugán at Sultánpúr in Kulu and on a large stone near the civil offices. I was never able while serving in the Káugra Valley to get at it myself, and made several unsuc-

hind the first letter; but they are perfectly detached, and seem never to have formed a part of the letter. If they be joined they would not produce an oblique line such as is required to produce the upper oblique spur of the Palí *ṃ*. R. M.

cessful attempts to get others to copy it for me. The Society may, however, have means of having it copied, and I therefore write to let them know of its existence. It is said locally to relate to the construction of the Kúl or open artificial watercourse in its neighbourhood."

"I send herewith some specimens obtained in 1878 of the local "Pahá-ri" alphabet still employed by the Kángra Baniahs and people of that class in the valley, as they may be of use. I would point out the position of short "i" as being *after* instead of *before* the consonant it qualifies as in ordinary Nágari, and the representation of long "i" by *two* strokes following the consonant, e. g., ग = गि and गः = गी.

The following papers were read—

1. *Note on some Ladák Mammals*.—By R. LYDEKKER, B. A.  
This paper is published in the Journal, Part I.
2. *On the Great Siva Temple of Ganjai-Koṇḍapuram, in the Trichinopoly District*.—By LIEUT.-COL. B. R. BRANFILL. Communicated by MAJOR-GENERAL J. T. WALKER, R. E., C. B., F. R. S. *Surveyor-General of India*.

(Abstract.)

The temple which is described in this paper is situate in the extreme E. N. E. part of the Trichinopoly District, 20 miles S. W. from Chidambaram. Roughly speaking it is a facsimile of the great Tanjore temple, possibly its prototype, or perhaps more probably a copy; but never having been "restored" as the Tanjore example has, and being built throughout in a very hard kind of stone, it retains much of its pristine appearance and purity of design, which has been lost there. It consists of a grand stone stubi or Vimánam, 100 feet square at base and about 165 feet high. Attached to it, on the east side, is the Mele-maṇḍapam, a three-storied portico or transept, covering the cross aisle between the north and south entrances to the temple. To its east again and attached to it, is the west wall and end of the great outer court (Veli-maṇḍapam), which was never completed. The whole is raised on a basement or terrace, at a height of about 5 feet above the (original) ground level. The paper also briefly describes some other places of architectural interest. In one of them, Chenji-kottai, the author found a curious carved stone lying in front of a small shrine dedicated to a local goddess called Kamala-kanni-y-Ammam to whom human sacrifices were formerly offered. It shows four human heads, surrounded by trisuls, ram's and buffalo's horns, arrows and a bow.

This paper, together with a sketch of the carved stone, will be published in the Journal, Part I.



3. *On the Coins of the Mahārājas of Kangra.*—By C. J. RODGERS,  
Principal of the Normal College, Amritsar.

(Abstract.)

This paper describes twenty-four coins of Kangra, commencing with Samanta Deva and ending with Triloka Chandra Deva. The former is supposed to have preceded Pithama or Pithama Chandra Deva, who is the first of the Kangra Rājās of whom coins have been found. He is assigned by General Cunningham to the year 1330 A. D. The date of Triloka Chandra Deva, according to the same authority (Arch. Report, Vol. V, p. 152), is 1610 A. D. All these coins have a bull on the Obverse, with the name of the king above it; the Reverse shows a horseman.

This paper will be published in the Journal, Part I.

4. *On the Barometer in Asia and Australia, and on the Sun-spot Cycle.*—  
By H. F. BLANFORD, F. G. S.

(Abstract.)

The three years 1876, 1877 and 1878 were characterized by a very persistent excess of atmospheric pressure throughout India and the Malay-an region. It was most intense on an axis lying between the Andamans and Bengal, and was relatively less both to East and West of this line. To the South, Singapore and Batavia showed a similar excess of pressure, less intense but more prolonged; and in Australia, the registers of Adelaide, Melbourne and Sydney show that there also the pressure was excessive; being most so at Adelaide, (where it exceeded that of any Indian Stations), and least so at Sydney. To the North again, in Asia the greatest excess is that shewn by stations in Western Siberia. It appears therefore as far as can be judged from the existing dates, that it was most intense on an axis lying obliquely across the two great continental masses of Asia and Australia.

An examination of the barometric registers of past years shows that at Batavia, Singapore and Port Blair there has been a regular and gradual rise of pressure since 1870, which at Singapore (situated in Lat. 2°) was of remarkable regularity. The register of Batavia which extends back to 1866 shows that at that station it reached a maximum in 1868, sank rapidly to a minimum in 1870 and rose to a maximum again in 1877, the oscillation thus conforming approximately to that of Sun-spot variation. With more or less regularity, the same oscillation is shown by the registers of other stations, and those of Calcutta and Bombay which reach back respectively to the years 1853 and 1847 prove that this variation with the

Sun-spot cycle is a regularly recurrent phenomenon, the minimum pressure coinciding with the maximum of sun-spots and *vice versâ*.

Turning to Siberia, an oscillation of the opposite kind is met with, and of much greater amplitude. It appears to be restricted to Western Siberia and European Russia, and is shewn most prominently by Ekaterinenburg at the Eastern foot of the Ural. It is equally great at St. Petersburg but more marked by non-periodic variations. But it is not distinctly traceable in the registers of Tiflis, nor in those of Nectchingk and Pekin. Those of the last station seem rather to indicate an oscillation of the Indo-Malayan type. In the Indo-Malayan region the variation was very decided as affecting all seasons of the year, being only somewhat more pronounced in the winter (of the Northern hemisphere) than in the summer months. But the opposite variation in Western Siberia was entirely restricted to the winter months.

From this it results that the excessive pressure of 1876-78 was the maximum phase of a cyclical variation in India and the Malay region; and there only. In Northern Asia it was quite anomalous, and most probably also in Australia; and even in the intervening Indo-Malayan region, it is probable that the phenomenon was intensified by an aperiodic or anomalous excess being superimposed on the regular and cyclical excess of pressure.

This paper will be published in Part II of the Journal.

### LIBRARY.

The following additions have been made to the Library since the Meeting held in December last.

### TRANSACTIONS, PROCEEDINGS AND JOURNALS, *presented by the respective Societies and Editors.*

Amsterdam. Koninklijk Zoologisch Genootschap *Natura Artis Magistra*,—Bijdragen tot de Dierkunde, Afl. 1—9.

———. ———. Jaarboekje, 1852, 1853, 1855, 1856, 1858-68, 1870, 1872-75.

———. ———. Nederlandsch Tijdschrift voor de Dierk. Deel I—IV.

Athens. Zigabenus' Commentary on St. Paul's Epistles.

Batavia. Bat. Gen. van Kunsten en Wetenschappen.

Indische Taal-, Land-en Volkenkunde, Deel XX.

———. ———. Verhandelingen, Deel XX.

- Berlin. K. Akad. der Wissenschaften,—Abhandlungen aus dem Jahre 1878.
- . K. preussische Akad. der Wissenschaften,—Monatsbericht, August 1879.
- Bordeaux. La Société de Géographie Commerciale,—Bulletin, Nos. 22 and 23, 1879.
- Calcutta. Geological Survey of India,—Memoirs, Vol. XVII, Part 1.  
*Blanford, W. T.*—Geology of Western Sind.
- . The Mahábhárata, No. 41.
- Cassel. Verein für Naturkunde,—Catalog der Bibliothek.
- Cherbourg. La Société Nationale des Sciences Naturelles,—Mémoires, Tome XXI, 1877-78.
- Dresden. Naturwissenschaftliche Gesellschaft Isis,—Sitzungs-Berichte, Jahrgang 1879, Jan.—June.
- Dublin. Royal Geological Society of Ireland,—Journal, Vol. V, Part 2, 1878-79.
- Munich. K. Bayerische Akademie der Wissenschaften,—Abhandlungen, histor. Classe, Vol. XIV, Part 3.
- . ———. Math.-physik. Classe, Vol. XIII, Part 2.
- . ———. Philos.-philol. Classe, Vol. XV, Part 1.
- . ———. Sitzungsberichte, Math.-physik. Classe, Hefte I and II, 1879.
- Heft II. *Pettenkofer*.—Ueber die Permeabilität des Bodens für Luft von Dr. Friederich Renk. Ueber den Uebergang von Spaltpilzen in die Luft von Dr. Isidor Soyka.
- . ———. Philos.-philol.-und histor. Classe, Heft III, of 1878 and Hefte I-III, of 1879.
- Leipzig. Deutsche morgenländ. Gesellschaft,—Zeitschrift, Vol. XXXIII, Part 4.
- London. Anthropological Institute,—Journal, Vol. IX, No. 1, August 1879.
- . Athenæum,—Nos. 2716—2720.
- . Nature,—Nos. 511, 525—527.
- . Royal Asiatic Society,—Journal, Vol. X, Parts I—III.
- Part I. *Brandreth, E. L.*—On the Non-Aryan Languages of India. *Mitra, P. Dása*.—A Dialogue on the Vedantic Conception of Brahma. *Friederich, R.*—An Account of the Island of Bali. *Rogers, E. T.*—Unpublished Glass Weights and Measures. *Boulger, S. C.*—China viâ Tibet. *Batten, J. H.*—Notes and Recollections on Tea Cultivation in Kumaon and Garhwâl.
- Part II. *Miles, Major-Gen. S. B.*—Note on Pliny's Geography of the East Coast of Arabia. *Gray, A.*—The Maldive Islands; with a Vocabulary taken from François Pyrard de Laval, 1602-7. *Forbes, Capt. C. J. F. S.*—On Tibeto-Burman Languages. *St. Barbe, H. L.*—Burmese Transliteration. *Forbes,*

*Capt. C. J. F. S.*—On the Connexion of the Môn of Pegu with the Koles of Central India. *Haupt, P.*—Studies on the Comparative Grammar of the Semitic Languages, with Special Reference to Assyrian. *Sauraire, H.*—Arab Metrology. *Kingsmill, T. W.*—The Migrations and Early History of the White Huns; principally from Chinese Sources.

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London. Royal Astronomical Society,—Memoirs, Vol. XLIV, 1877-79.

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———. Royal Geographical Society,—Proceedings, Vol. I, Nos. 10 and 11, October and November 1879.

No. 10. *Martin, Capt. G.*—Survey Operations of the Afghanistan Expedition; the Kurram Valley.

———. Royal Microscopical Society,—Journal, Vol. II, No. 6, October 1879.

*Ord, W.*—On some causes of Brownian Movements. Record of Current Researches.—Zoology. Connective Tissue. Mechanical Genesis of Tooth Forms. Chromatophores of the *Cephalopoda*. Action of Strychnine on Gasteropodous Molluscs. Animal of *Voluta Musica*. Anatomy and Physiology of the Digestive Organs of the *Myriapoda*. *Pentastoma tenuicollis* in the ear of a Dog. The Nebaliad Crustacea as Types of a New Order. Physiology of the Nervous System of the Crayfish. Blood of the Lobster. Observations on the *Amphipoda*. Contributions to the Natural History of the *Caprellidae*. *Caprellidae* of the Mediterranean. Glands found in the Appendages of the *Phronimida*. Some young Stages of *Pencus Caramote*. Hermaphroditism of the *Isopoda*. *Planaria Limuli*. *Ascaris* parasitic in the Lion. *Ascaris* of the Orang-Outang. Spermatophores of the Earth-worm. Body-cavity of the Sedentary *Annelida* and their Segmental Organs. Segmental Organs of the *Capitellidae*. Anatomy of the *Ophiurida*. *Comatulæ* of the "Challenger" Expedition. New Genera and Species of Corals. *Eozoon Canadense*.—Botany. Anatomical and Physiological Study of Nectaries. Causes of the Change in Form of Etiolated Plants. Effects of Submersion on Aerial Leaves and of Water on Floating Leaves. Absorption of Water by the Lamina of Leaves. Contribution to the Germ Theory. Nature of the Fur on the Tongue. Injection of *Bacteria* into the Blood without any Toxic Effects.—Microscopy, &c. Hæmatoxylic Eosin and its Employment in Histology. Brösicke's Staining Method. Method of Examining Living Cells of Larva of Newt. Novel Method for Focussing. Roy Microtome. Improvements in Microphotography. Modern Applications of the Microscope to Geology.

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*Gamgee, Prof. A.* and *Blankenhorn, Dr. E.*—On the Existence of Liebreich's Proton in the Brain. *Roberts, Dr. W.*—Note on the Existence of a Milk-

curdling Ferment in the Pancreas. *Rosse, Earl of.*—On some Recent Improvements made in the Mountings of the Telescopes at Birr Castle. *Darwin, G. H.*—The Determination of the Secular Effects of Tidal Friction by a Graphical Method. *Abney, Capt.*—On the Production of Coloured Spectra by Light. *Bottomley, J. T.*—Preliminary Experiments on the Effects of Long-continued Stress on the Elasticity of Metals. *Lockyer, J. N.*—On a New Method of Studying Metallic Vapours.

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*Tristram, Rev. H. B.*—Description of a New Species of Wood-pecker from the Island of Tzus Sima, near Japan. *Moore, F.*—Descriptions of new Genera and Species of Asiatic *Lepidoptera Heterocera*. *Angas, G. F.*—Description of ten New Species of *Azinæa* and *Pectunculus* in the Collections of Mr. S. Hanley and the late Mr. T. L. Taylor. *Godwin-Austen, Lieut.-Col. H. H.*—Notes on and Description of the Female of *Cerionis blythii* (Jerdon). *Sclater, P. L.*—Remarks on two volumes of original drawings of the birds of India by Brigadier-General A. C. McMaster. *Garrod, Prof.*—Notice of a Memoir on the brain and other parts of the Hippopotamus. Note on the Mechanism of Respiration as well as of the Retraction of the Head and Limbs in certain *Chelonia*. *Jeffreys, J. G.*—On the Mollusca procured during the "Lightning" and "Porcupine" Expeditions, 1868-70. *Salvadori, T.*—On *Acornus inornatus*, Salvad. *Bell, F. J.*—Observations on the Characters of the *Echinoidea*. II. On the Species of the Genus *Triplentes*, Agassiz.

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MUIR, J. Metrical Translations from Sanskrit Writers, with an Introduction, Prose Versions and Parallel Passages from Classical Authors. 8vo., London, 1879.

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Report on the Administration of Bengal, 1878-79. 8vo., Calcutta, 1879.

BENGAL SECRETARIAT.

Brief Sketch of the Meteorology of the Bombay Presidency in 1878. 8vo., Bombay, Pamphlet.

BOMBAY GOVERNMENT.

Report on the Trade and Resources of the Central Provinces for the year 1878-79. Fcp., Nagpur, 1879.

CH. COMMISSIONER, CENTRAL PROVINCES.

RAVENSHAW, J. H. Gaur: its Ruins and Inscriptions. Rl. 8vo., London, 1878.

MRS. G. H. DAMANT.

The Rajputana Gazetteer,—Vol. II. 8vo., Calcutta, 1879.

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Indian Antiquary,—Vol. VI, Part 69, July 1877.

Fallon's New Hindustani-English Dictionary, Part XXV, October 1879.

Scientific Results of the Second Yarkand Mission. *Syringosphæridæ*; by Prof. P. M. Duncan. *Lepidoptera*; by F. Moore.

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LYMAN, B. S. Geological Survey of Japan. Reports of Progress for 1878 and 1879. 8vo., Tokyo, 1879.

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MEYER, W. Ueber Calderons Sibylle des Orients. 4to., Munich, 1879.

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Proceedings of the Anjuman-i-Punjab in connexion with the proposed Vaccination Bill and Dr. Cunningham's Sanitary Primer. Fcp., Lahore, 1879.

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Annual Report on the Lunatic Asylums in the Madras Presidency during the year 1878-79. Fcp., Madras, 1879.

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OUDEMANS, DR. C. A. Rede ter Herdenking van den Sterfdag van Carolus Linnæus. 8vo., Amsterdam, 1878.

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ROY. ZOOL. SOCIETY OF AMSTERDAM.

List of the Vertebrate Animals, now or lately living in the Gardens of the Zoological Society of London. Seventh Edition. 8vo., London, 1879.

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- Calcutta. Calcutta Review,—No. 93, May 1868.
- . Indian Medical Gazette,—Vol. XIV, No. 12, and Vol. XV, No. 1.
- . Stray Feathers,—Vol. VIII, Nos. 2—5.
- Geneva. Archives des Sciences Physiques et Naturelles, Tome II, No. 11.
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- . Nachrichten,—Nos. 14—16.
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- . Beiblätter,—Band III, Stück 12.
- London. Academy, Nos. 271, 390, 393—397.
- . Annals and Magazine of Natural History,—Vol. IV, No. 23, November 1879.
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- Butler, A. G.—Descriptions of New Species of Lepidoptera from Japan.
- Carter, H. J.—On the Nutritive and Reproductive Processes of Sponges.
- Wood-Mason, J.—Preliminary Notice of a new Genus (*Parectatosoma*) of *Phasmida* from Madagascar, with brief descriptions of its two Species. Thomas, O.—On Robert Kerr's Translation of the "Systema Naturæ" of Linnæus.
- Schnetzler, M. B.—On the Part played by Insects during the Flowering of *Arum crinitum*, Ait.
- London. Chemical News,—Nos. 905, 909, 912, 920, 984, 990, 1042,—1046.
- No. 1042-46. Mendeleef, D.—The Periodic Law of the Chemical Elements.
- . Journal of Botany,—Nos. 188, 202 and 203.
- No. 203. Vines, S. H.—On Alternation of Generations in the *Thallophytes*.
- . Edinburgh Review,—No. 308, October 1879.
- Afghanistan.
- . The Entomologist's Monthly Magazine,—Vol. XVI, No. 186, November, 1879.
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- Weir, J. J.—Effect of the wet sunless season on the Lepidoptera of the New Forest.
- London. Messenger of Mathematics,—Vol. IX, Nos. 6 and 7, October and November 1879.
- . Quarterly Journal of Pure and Applied Mathematics,—Vol. XVI, No. 64, October 1879.
- . Quarterly Journal of Microscopical Science,—Vol. XIX, No. 76, October 1879.
- Lankester, E. R.—*Lithamæba Discus*, nov. gen. et sp., one of the *Gymnomyza*.

- The structure of *Haliphysema Tumanowiczii*. *Gibbes, Heneage*.—On the Structure of the Vertebrate Spermatozoon.
- London. *Mind*,—No. 16, October 1879.
- . *Nineteenth Century*,—Vol. VI, No. 33, November 1879.
- Giles, H. A.*—The Book Language of China.
- . The London, Edinburgh and Dublin Philosophical Magazine,—Nos. for February 1823, January-December 1828, January 1829, February 1838, January-December 1839, January 1872 and November 1879.
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- . The Publishers' Circular,—Vol. XLII, Nos. 1012 and 1013.
- . *Quarterly Review*,—No. 296, October 1879.
- . The Monthly Journal of Science,—Vol. I, Nos. 60 and 61, October and November 1879.
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- . The Quarterly Journal of Science,—Vol. II (New Series).
- . *Journal of the Society of Arts*,—Nos. 1110, 1286, 1307, 1340, 1341, 1407—1412.
- No. 1407. *Preece, W. H.*—Recent Advances in Telegraphy.
- No. 1408. The India Museum.
- . *Westminster Review*,—No. 112, October 1879.
- The Indian Mutiny. India and our Colonial Empire.
- Paris. *Comptes Rendus*,—Vol. LXXXIX, Nos. 18—22.
- Caligny, A. de.*—Expériences sur un siphon renversé à deux branches horizontales, pouvant élever de l'eau à des hauteurs considérables, &c. *Klercker, de.*—Sur le spectre anormal de la lumière. *Franchimont.*—Sur la cellulose animale ou tunicine. *Jolly, L.*—Recherches sur les différents modes de combinaison de l'acide phosphorique dans la substance nerveuse. *Heckel, E.*—Des poils et des glandes pileuses, dans quelques genres de *Nymphéacées*.
- . *Journal des Savants*,—October and November 1879.
- . *Revue des deux Mondes*,—Tome XXXVI, Liv. 2 and 3.
- . *Revue Critique*,—Vol. VIII, Nos. 45—49.
- . *Revue Scientifique*,—Vols. VII; IX; X; XVII, Nos. 20—23.
- No. 20. *Boulard, J.*—La Transmission de la Force Motrice par l'intermédiaire de l'électricité. Les Dragages sous-marins d'Alexandre Agassiz. Le golfe du Mexique et la mer des Antilles.

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OLDENBERG, DR. H. The Dipavamsa ; edited and translated. 8vo., London, 1879.

Parliamentary Papers. Papers relating to the Admission of Natives to the Civil Service of India. Fcp., London, 1879.

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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL,  
FOR FEBRUARY, 1880.

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The Annual Meeting of the Asiatic Society of Bengal was held on the 4th of February, 1880, at 9 P. M.

H. B. MEDLICOTT, Esq., F. R. S., President, in the Chair.

According to the Bye-Laws of the Society, the President ordered the voting papers to be distributed for the election of Officers and Members of Council for 1880, and appointed Lt.-Col. Sconce and M. von Eetvelde, Scrutineers.

The PRESIDENT called upon the Secretary to read the Annual Report.

ANNUAL REPORT FOR 1879.

In presenting the following report on the condition of the Society during the year 1879, the Council are glad to be able to congratulate the Members again upon the satisfactory state of its affairs. Thirty-three Members were added to the list during the year, of whom 2 were old Members who were re-entered without election, and 31 were new Members. The total number removed from the list was 32, of whom 10 died and 14 retired. The total number of Ordinary Members at the end of the year was 329 as compared with 327 at the end of 1878. Of the Ordinary Members 36 are absent from India, and of the rest 111 are Resident, 154 Non-Resident, 16 Foreign and 12 Life Members.

The annexed tabular Statement shows the fluctuation in the number of Ordinary Members during the past 6 years.

YEAR.	PAYING.				NON-PAYING.		TOTAL.
	Total.	Resident.	Non-Resident.	Foreign.	Life.	Absent.	
1874 .....	312	127	184	...	3	32	346
1875 .....	292	113	179	...	3	50	345
1876 .....	294	119	175	...	5	48	347
1877 .....	290	113	163	14	9	46	345
1878 .....	285*	117	153	15	13	29	327
1879 .....	281	111	154	16	12	36	329

During the year Professor Henry and M. Stanislas Julien, two of the Honorary Members of the Society, died. To fill the vacancies thus caused and others existing previously, the following gentlemen have been appointed to be Honorary Members:—Prof. E. B. Cowell, Dr. A. Günther, Dr J. Janssen, Prof. H. Milne-Edwards, Prof. P. Regnaud, and M. E. Renan.

The following names of Ordinary Members appear in the obituary of the year:—

Nawab Amir Ali Khan Bahadur, Mr. R. S. Brough, Mr. G. B. Damant, Mr. R. B. Shaw, Mr. H. C. Sutherland, the Maharaja of Vizianagram, Mr. G. Robb, Mr. F. L. Beaufort, Mr. F. Wilcox and Capt. C. J. F. Forbes, F. R. G. S.,

In Mr. Brough the Society lost a most active Member. He died suddenly of cholera, on the 3rd April, having only the previous evening attended, apparently in good health, a meeting of the Society; and assisted in showing experiments in connection with a paper on a “new standard of light” read by Mr. Schwendler. He promised to become in time an eminent physicist, and was the author of the following papers in the Proceedings of the Society:—

In 1877. “A theoretical deduction of the best resistance of a telegraph receiving instrument.”

“Note on Prof. Graham Bell’s telephone.”

“On a case of lightning; with an evolution of the potential and quantity of the discharge in absolute measure.”

“On the diameter of the wire to be employed in winding an electro-magnet in order to procure the maximum magnetic effect.”

In 1878. “Magnetic elements for northern India.”

\* A mistake was printed in last year’s Report.

“On the proper relative sectional area for copper and iron lightning rods.”

#### Indian Museum.

The following presentations made to the Society have been transferred to the Indian Museum under the provisions of Act XXII of 1876.

(1). Sculptural stones from Buddha Gaya, presented by the Government of Bengal, through Dr. R. Mitra.

(2). Three small figures; one stone, one bronze, and one copper.

(3). A celt found by Capt. Badgley at Shillong, in 1873.

(4). Geological and other specimens collected by Lieutenant R. C. Temple in the march between Kala Abdullah Khán and Lugári Bárkhán.

Three vacancies in the office of Trustee having occurred through the departure to England of Mr. W. T. Blanford, the President; of Major J. Waterhouse and of Mr. T. S. Isaac,—Dr. Hoernle, Dr. Lewis and Mr. Crawford were elected Trustees on the part of the Society.

#### Finance.

It will be seen from the accounts annexed to this Report that the financial condition of the Society is satisfactory, notwithstanding the loss of income involved in the reduction of the rate of interest on its investments in Government Securities.

A special Committee was appointed during the year to consider and report on the form of account hitherto kept by the Society, and, in accordance with its recommendations, the system of accounts is now under revision. Mr. Westland, to whom the thanks of the Society are due for undertaking this important work, has completed the revision of the Society's accounts, which will accordingly be found published in a form somewhat differing from that adopted in former years. Similarly, the accounts of the O. P. Fund and Conservation of Sanskrit MSS. Fund will shortly be revised and placed on a more satisfactory footing.

#### London Agency.

At the close of 1878 there was a balance due from the Society to Messrs. Trübner and Co., amounting to £28-10-2. The sale proceeds of the Society's publications, sold by Messrs. Trübner during that year, amounted to Rs. 868-1-7 and of the Bibliotheca Indica to Rs 311-4-0.

Nineteen invoices, consisting of publications of Scientific Societies presented to the Society, and of books purchased, were received from Messrs. Trübner and Co. during the past year. The money value of these consignments was £136-17-8. 404 copies of the Journal, and 316 copies of the Proceedings were despatched to them for sale, besides 628 copies of the Bibliotheca Indica publications.

**Library.**

The additions to the Library during the year comprise in all 1,433 volumes or parts of volumes. Of these, 741 were received as presentations from Government, from authors, or by exchange, and 692 were purchased.

In last year's report it was stated that the Catalogue of the books in the Library which had been carried out under the late Mr. Blochmann required careful revision. On examination, the work done was found to be defective and it is now being carefully revised under the directions of the President. Twenty-two book-cases have been examined, and the cataloguing of 2,431 books carefully checked. As there are more than 7,570 books, in cases numbered up to 86, it appears that little more than a quarter of the work is accomplished. It is necessarily a tedious process, and cannot be hurried through, while the Assistant Secretary can only give it his spare hours from current work.

**Publications.**

The publications issued by the Society during the year comprise 10 numbers of the Proceedings consisting of 293 pages of text with 11 plates. Four numbers of the Journal Part I, have been issued containing 405 pages, illustrated with 9 plates. Of the Journal Part II, 4 numbers also have been issued consisting of 234 pages of text with 25 plates. The Title-Page and Index of Part II of 1879, will be issued with No. 1 for 1880, and the fourth part of Part I of 1879 will be published in a few days.

The 1st Part of the extra number to which allusion was made in last year's report, containing Moore and Hewitson's "Descriptions of New Indian Lepidoptera found in the collection of the late Mr. W. S. Atkinson" has now been received, and is ready for distribution to Members.

**Building.**

The total amount expended in repairs to the Society's premises during the year was Rs. 438-8-0. Besides this, Rs. 110 was spent on removing 4 ancient pillars supporting the staircase, which were claimed by the Trustees of the Indian Museum, and substituting light iron pillars. Half of this charge was recovered from the Trustees of the Museum.

**Coin Cabinet.**

The additions to the Coin Cabinet have been very large during the year under review. The total number of coins added, is 167. This is, in a great measure, owing to the orders of Government, issued, at the instance of the Council, to the Civil Authorities throughout the country to inform the Asiatic Society of all finds of coins within their respective jurisdictions, in order to give it a chance of purchasing. Accordingly a large number of

purchases have been made; altogether 122. Among these are four gold coins, two Roman (of Domitian and Vespasian) and two South Indian (a Pagoda and a Mada). Again 114 silver coins; *viz.*, 19 of Sher Sháh of Delhi (six are new); 15 of Islám Sháh of Delhi; 1 of Muhammad Sháh of Bengal, 1 of Sultán Jalál-uddin Muhammad Sháh of Bengal; 2 of Bahádur Sháh of Bengal; 1 Surat Sháhi; 1 of Sher Sháh of Lakhnau, 1 Machlidár of Lakhnau; 1 Tara Sháhi; 1 Choli Mohesh; 1 of Burhampur, 1 of Banjrangah; 12 from Guzarát (Pathoos?); 12 from Budaon (five with the imperfect legend Sri Mahama.....); 2 of Mahmúd Sháh (from Bijnaur)\*; 1 from Sattara; 1 from Surat; 1 from Nassik; 1 Bakhri Rupee; 14 intermediate between the Indo-Scythian and the Adi Varáha series; 12 early Hindu punched coins from Hoshiarpur and the 24-Parganahs; 3 oboli of Alexander; 1 of Ptolemy Philadelphus, 1 of Antiochus Epiphanes, 1 of Antiochus, 1 of Philip III of Macedon, 1 of Antoninus, 1 of Demetrius, and four unnamed. The copper coins purchased are four; *viz.*, 2 of the Bull and Horseman type (from Hoshiarpur); 1 large Alexander, and 1 large Antoninus.

The number of coins presented is 45; *viz.*, 8 gold, 3 silver, and 34 copper. Among these there are two gold (one of Chandragupta II and one of the series intermediate between the Guptas and the Indo-Scythians) and two copper (of Azes and of Su-Hermaeus) from F. S. Growse, Esq., c. s.; 6 gold (out of the Ahin Posh Tope find, 3 of Kadphises, and 3 of Kanerki) from the Indian Government; 3 silver (of Bahádur Sháh, Sher Sháh and Islám Sháh) from Babu Surjyanarain Singh; 29 copper (of the Maharájahs and Sultáns of Kashmir) from Charles J. Rogers, Esq., Principal of the Normal College in Amritsar; and 3 copper (modern Nepali pice) from Syed Ahmed Khán.

A Catalogue of all the coins in the Society's Cabinet is in course of preparation.

#### Secretary's Office.

Dr. A. F. R. Hoernle has continued to hold the Philological Secretaryship and charge of Part I of the Journal.

Major J. Waterhouse performed the duties of General Secretary till December, when Mr. J. Crawford was appointed in his place. Major Waterhouse also edited Part II of the Journal until Mr. Wood-Mason resumed the Natural History Secretaryship in October.

\* Legend; *obv.*, the great king, conqueror of the world and faith, Abul Muzaffar Mahmúd, son of the king. *Rev.*, during the reign of Mu'tasim, Lord of the Faithful. Round the circle on both sides, struck this silver coin in the city of Delhi in the year 653 Hijra.



The Treasurership has been held throughout the year by Mr. Beverley, with the exception of about 3 months from May to July, when Mr. Medlicott acted for him.

Mr. W. E. Bateman resigned the Assistant Secretaryship in February, and Mr. W. A. Bion was appointed in his place.

Mr. Andrews, and Babus Kedarnath Bysack and Ramjibun Mookerjea have continued to hold the post of Assistant Librarian, Cashier and Assistant Cashier respectively. Babu Jadubinda Bysack left the service of the Society in September, and was succeeded, as storekeeper, by Babu Jogendranath Mittra.

#### Bibliotheca Indica.

In the two series together, twenty-four fasciculi were issued during the year; four in the Persian, and twenty in the Sanskrit. They belong to eleven different works, of which three, in the Sanskrit series, have been completed. The latter are the Agni Purāṇa, the Chaturvarga Chintāmani and the Kātantra. Of the works published one, in the Persian series, is an English translation of the Tabaqāt-i-Nāṣirī; the rest are text editions, nine in Sanskrit and one in Persian.

#### A. Persian Series.

Major H. G. Raverty has brought out two fasciculi of his annotated English translation of the TABAQĀT-I-NĀṢIRĪ. The addition of two more fasciculi, it is expected, will complete the work.

Maulvi Abdur Rahim of the Calcutta Madrasah has issued one double-fasciculus, consisting of two numbers, of the Persian text of Abul Fazl's AKBAR NAMAḤ. These complete the second volume of the work, of which one volume more remains to be published, in order to complete it. It contains the history of Akbar's reign to 980 Hejira (A. D. 1572). An index to Vol. II of all proper names mentioned in it, similar to that of Vol. I, will also be published.

#### B. Sanskrit Series.

Dr. Rājendralāla Mitra has brought out the last fasciculus of the AGNI PURĀṆA. The text edition of that work was completed last year in three volumes. Dr. Mitra has now added an English introduction, which very fully describes the contents of that important work. It is a sort of Cyclopædia of Sanskrit Literature, and is beside the Vishnu Purāṇa and the Vayu Purāṇa, the most ancient and most authentic of that class of Sanskrit works. The text of the first has been edited twice, though not by this Society. An edition of the text of the second is now in course of publication by the same learned editor, to whom the Society is indebted for the edition of the Agni Purāṇa.

Of the *VAYU PURĀNA*, the editor of which, as above mentioned, is Dr. Rājendralāla Mitra, three fasciculi have been issued. An English translation of this work will appear under the auspices of the Oxford University authorities.

The text of the *TAITTIŘĪYA SAMHITĀ*, which is edited by Paṇḍit Maheṣachandra Nyayaratna, the Principal of the Sanskrit College, has been advanced by two fasciculi. The work contains the earliest recension of the mantras of the Black Yajur Veda together with the commentary of Mādhava Āchārya.

The same learned editor has also issued one more fasciculus of the *MĪMĀNSA DARŚANA*, a critical commentary on the Ritual of the Veda accompanied by the commentary of Śavara Svāmin.

Of the *GOBHILĪYA GR̥HYA SŪTRA* three fasciculi have appeared. The edition is illustrated by a commentary compiled by the editor himself, Paṇḍit Chandra Kānta Tarkālankāra. The work is expected to be completed in the course of the current year ; only one more fasciculus is wanting.

Paṇḍit Bāla Sāstrī, of the Benares College has brought out the seventh fasciculus of the *BHĀMATI*, which is a Gloss on Sankara Āchārya's commentary on the Brahma Sūtras by Vāchaspati Miśra. Owing to ill-health the learned editor was not able to complete the work during the past year, as he had hoped to do ; but there is every prospect of its being concluded in the present year.

Six fasciculi have been issued of *HEMĀDRI'S CHATURVARGA CHINTĀMANI*. This concludes the second volume. Three MSS. of one of the three remaining volumes, the *Sraddha Khaṇḍa*, have been collected. The rest cannot be published, for want of MSS. from which to edit them.

The scholarly edition of the *KĀTANTRA*, for which the Society is indebted to Professor J. Eggeling of Edinburgh, has also been completed during the year, by the issue of the fifth and the sixth fasciculi. The last fasciculus is enriched by excellent critical notes and an index of Sūtras, contributed by the editor. This is one of the most important grammatical works of India, inasmuch as it is the most complete existing representative of the Sanskrit Grammar before Pāṇini. The text contains both the sūtras and the commentary on them by Durga Siṅha.

Dr. A. F. Rudolf Hoernle's edition of the *PRITHVĪRĀJA RASAU*, the famous epic of Chānd Bardāi in old Hindi, has advanced by one fasciculus, the third of Part II. The work is a large one and the difficulties, owing to the ancient character of its language, considerable ; moreover one of the co-editors, Mr. J. Beames, who has published one fasciculus of Part I, has retired from the work. It will be some time, therefore, before it can be brought to a conclusion.

The following is a detailed list of the publications issued during 1879.

*Persian Series.*

1. TABAQÁT-I-NÁŠIRÍ, by Abú 'Amr i-'Usmán, translated by Major H. G. Raverty. Nos. 358 and 359. Fasc. IX and X.

2. AKBÁR-NÁMAH, by Abul-Fazl-i-Mubárah-i-Allámí, edited by Maulawí 'Abd-ur-Rahím, Calcutta Madrasah. Nos. 431, 432. Vol. II, Fasc. IV.

*Sanskrit Series.*

3. AGNI PURÁṆA, a system of Hindu Mythology and Tradition, edited by Dr. Rájendralála Mitra, C. I. E. No. 421. Fasc. XIV, (Introduction).

4. VAYU-PURÁṆA, a system of Hindu Mythology and Tradition, edited by Dr. Rájendralála Mitra, C. I. E. Nos. 420, 424, 428. Fasc. I—III.

5. TAITTIRÍYA SAMHITÁ, of the Black Yajur Veda, with the commentary of Mádhava Áchárya, edited by Paṇḍit Maheṣa Chandra Nyayaratna. Nos. 239, 241. Fasc. XXX and XXXI.

6. MÍMÁṆSA DARŚANA, with the commentary of Sávara Svámin, edited by Paṇḍit Maheṣa Chandra Nyayaratna. No. 388. Fasc. XIV.

7. GOBHILÍYA GRÍHYA SÚTRA, with a commentary by the editor, edited by Chandra Kánta Tarkálankára. Nos. 415, 416, 423. Fasc. VIII, IX, X.

8. BHÁMATÍ, a Gloss on Sankara Áchárya's commentary on the Brahma Sútras by Váchaspati Miśra, edited by Paṇḍit Bála Sástri. No. 427. Fasc. VII.

9. CHATURVARGA CHINTÁMANI, by Hemádri, edited by Paṇḍits Yogeṣvara Bhaṭṭáchárya and Kámákhyánátha Tarkaratna. Nos. 417, 418, 419, 422, 426, 429. Vol. II, Part, II, Fasc. VII—XII.

10. KÁTANTRA, with the commentary of Durga Siñha, edited with notes and indexes, by Dr. Julius Eggeling. Nos. 396, 397. Fasc. V and VI.

11. PRITHIVÍJA RASAU, of Chand Bardái in the original old Hindí by Dr. A. F. Rudolf Hoernle. No. 430. Part II. Fasc. III.

Among the works which it is contemplated by the Society to publish in the place of those which have been completed or are approaching completion, there are the following :

*Arabic-Persian Series.*

1. English Translation of the Tariḫ-ul-Ḳhulfa by Jaláluddín-us Suyúti with a short memoir of the author, by Major H. S. Jarrett, B. S. C.

2. English Translation, with notes, of Vol. II. of the Ain-i-Akbari, uniform with the late Mr. Blochmann's annotated translation of Vol. I, by Captain H. W. Clarke, R. E.

*Sanskrit Series.*

1. MĀITRĀYANĪ SAMHITĀ, one of the best known texts of the Yajur Veda, edited by Dr. L. Schroeder.

2. English Translation with notes, of the KATHĀ SARIT SĀGARA, the well-known treasury of Indian Folklore, by C. H. Tawney Esq., M. A., Principal of the Presidency College.

3. English Translation with notes, of the CHARAKA, the oldest Hindu work on Medicine, by Dr. Mahendralāla Sarcār.

*List of Societies and Institutions with which Exchanges of Publications have been made during 1879.*

Amsterdam :—Royal Zoological Society.

Batavia :—Batavian Society of Arts and Sciences.

Berlin :—Royal Academy.

Berne :—Swiss Entomological Society.

Bombay :—Bombay Branch, Royal Asiatic Society.

——— :—Editor, Indian Antiquary.

Boston :—Natural History Society.

Bordeaux :—Bordeaux Academy.

Buenos Ayres :—Public Museum.

Brussels :—Royal Academy of Sciences.

——— :—Geological Society of Belgium.

Calcutta :—Agricultural and Horticultural Society of India.

——— :—Geological Survey of India.

Cherbourg :—National Society of Natural Science.

Christiana :—University Library.

Copenhagen :—Royal Society of Northern Antiquaries.

Cambridge :—University Library.

Colombo :—Royal Asiatic Society, Ceylon Branch.

California :—Californian Academy of Arts and Sciences.

Dehra-Dun :—Great Trigonometrical Survey.

Dublin :—Royal Irish Academy.

Edinburgh :—Royal Society.

Geneva :—Physical and Natural History Society.

Genoa :—Museum of Natural History.

Königsberg :—Physical and Economical Institution.

Leipzig :—German Oriental Society.

Leyden :—Royal Herbarium.

Liège :—Royal Society of Sciences.

- London :—Royal Society.  
 ——— :—British Museum.  
 ——— :—Royal Asiatic Society of Great Britain and Ireland.  
 ——— :—Royal Institution.  
 ——— :—Institution of Civil Engineers.  
 ——— :—Institution of Mechanical Engineers.  
 ——— :—Royal Geographical Society.  
 ——— :—Zoological Society.  
 ——— :—Statistical Society.  
 ——— :—Geological Society.  
 ——— :—Linnean Society.  
 ——— :—Anthropological Institute.  
 ——— :—Royal Astronomical Society.  
 ——— :—Royal Microscopical Society.  
 ——— :—Editor, *Athenæum*.  
 ——— :—Editor, *Academy*.  
 ——— :—Editor, *Nature*.  
 ——— :—Society of Telegraph Engineers.  
 Lyon :—Agricultural Society.  
 ——— :—Natural History Society.  
 ——— :—Museum of Natural History.  
 Madras :—Literary Society.  
 Manchester :—Literary and Philosophical Society.  
 Moscow :—Société des Naturalistes.  
 Munich :—Royal Academy.  
 Netherlands :—Royal Society.  
 New Haven, U. S. :—Connecticut Academy of Arts and Sciences.  
 New South Wales :—Royal Society.  
 Oxford :—Bodleian Library.  
 Paris :—Imperial Library.  
 ——— :—Anthropological Society.  
 ——— :—Asiatic Society.  
 ——— :—Geographical Society.  
 ——— :—Zoological Society.  
 Philadelphia :—Academy of Natural Science.  
 Pisa :—Tuscan Society of Natural Sciences.  
 Stettin :—Entomological Society.  
 Stuttgart :—Natural History Society of Wurtemberg.  
 St. Petersburg :—Imperial Library.  
 ——— :—Imperial Russian Geographical Society.  
 ——— :—Imperial Academy of Sciences.  
 ——— :—Imperial Botanical Gardens.

Stockholm :—Royal Academy of Sciences.

Trieste :—Adriatic Society of Natural Science.

Turin :—Academy.

United States, America :—Geological Survey of the Territories.

Vienna :—Imperial Geological Institute.

——— :—Anthropological Society.

——— :—Imperial Academy of Sciences.

——— :—Zoological Society.

Washington :—Smithsonian Institution.

——— :—Commissioners of the Department of Agriculture.

Yokohama :—German Oriental Society.

——— :—Asiatic Society of Japan.

#### ABSTRACT OF PROCEEDINGS OF COUNCIL DURING 1879.

##### *January 2nd. Ordinary Meeting.*

A recommendation of the Finance Committee, with reference to a letter from Messrs. Trübner and Co., dated 13th August, that Messrs. Trübner should be allowed to sell the Journal and Proceedings at 4s. and 1s. respectively, while accounting to the Society at the rate of 3s. and 9d., was agreed to.

##### *January 30th. Ordinary Meeting.*

The sale of the out-house situated at the north-west corner of the Society's premises for Rs. 100 was approved of.

##### *February 4th. Special Meeting.*

The Annual Report and Accounts were submitted.

##### *February 27th. Ordinary Meeting.*

The Members of the Finance and other Committees were elected.

##### *March 27th. Ordinary Meeting.*

The Proceedings were ordered to be sent monthly by Parcel Express, and the Journals quarterly, to Messrs. Trübner and Co.

Dr. A. F. R. Hoernle's offer to make a Catalogue raisonné of the coins in the Society's Cabinet was accepted.

It was resolved that the Government should be asked to give the Society some of the duplicates among the coins found in the Abin Posh Tope.

Mr. J. Westland was appointed a Member of the Finance Committee.

Copies of Mr. H. Rivett-Carnac's letters on the subject of the preservation of Antiquarian Remains were ordered to be submitted to Government, with a suggestion from the Council, that District Officers and Engi-

neers of State Railways should be requested to preserve all Archæological Remains they might come across.

A letter from the Secretary to the Government of India, Department of Revenue, Agriculture and Commerce, No. 69 (Marine Surveys), dated 18th March, forwarding copy of a letter from Commander A. D. Taylor on the subject of the Sea Dredging Operations, and requesting that the Government may be favoured with any remarks which the Society may desire to offer thereon, was referred to the Dredging Committee.

*May 1st. Ordinary Meeting.*

A letter was read from the Under-Secretary to the Government of Bengal, No. ७८<sup>g</sup> Misc., dated 27th March, forwarding a copy of a letter from the Officiating Secretary to the Government of India, Home Department, No. 654, dated 18th March, conveying the thanks of the Governor-General in Council to Dr. Rájendralála Mitra for his suggestions on the subject of the discovery and preservation of the records of ancient Sanskrit literature. The letter was ordered to be recorded.

A letter was read from the Under-Secretary to the Government of Bengal, No. ७८<sup>g</sup> Misc., dated 27th March, forwarding copy of a resolution dated 18th March, re-distributing the sum of Rs. 24,000 sanctioned for the preservation of Sanskrit MSS., and requesting that a report of the progress made in all branches of the work may be submitted as early as possible after the close of the official year 1879-80. The letter was ordered to be recorded, and a copy to be sent to Dr. Mitra with a request that he would be kind enough to prepare the required report.

A request that the Society's publications should be sent to the Chandernagore Pustakagar was declined.

The Minutes of the Council upon a letter from the Under-Secretary to the Government of Bengal No. ७८<sup>g</sup> Misc., dated 27th March, appointing the President and Natural-History Secretary *ex-officio* Members of the Zoological Gardens Committee, was ordered to be recorded.

Professors Cowell, Regnaud and H. Milne-Edwards and Drs. Rájendralála Mitra, Janssen and Günther were nominated Honorary Members.

The Secretary reported that Mr. H. B. Medlicott had agreed to undertake the duties of Treasurer to the Society, during Mr. Beverley's absence on leave.

*May 29th. Ordinary Meeting.*

A letter from the Officiating Under-Secretary to the Government of India, Department of Revenue, Agriculture and Commerce, No. 113, dated 22nd May, stating that, owing to the present financial pressure, the Government find it impossible to engage the services of Messrs. Murray and Piercy to aid the Sea Dredging Operations, was ordered to be recorded.

The exchange of the Society's publications, containing botanical papers, for the "Acta Horti Petropolitani" was sanctioned.

A Committee, composed of Messrs. Beverley, Westland and Douglas, was appointed to consider the question of a change being made in the keeping of the Society's accounts.

The question of Captain H. W. Clarke's translation of the 2nd volume of the Ain-i-Akbari was ordered to be deferred, as definite information had been received that Mr. Blochmann had completed the translation of the 2nd volume before his death.

The notice of the proposed change of Rule 14e was ordered to be circulated to Resident Members.

An application from the Geographical Society of Metz for an exchange of publications was declined.

The sum of Rs. 300 was ordered to be remitted to Mr. Grote for the purchase of coins from the Freeling Collection.

Mr. J. Douglas was appointed a Member of the Finance, and Major Jarrett of the Philological, Committee.

*June 26th. Ordinary Meeting.*

A reward of Rs. 100 was ordered to be offered to any one giving information that would lead to the discovery of the MSS. of the late Mr. Blochmann's translation of the 2nd volume of the Ain-i-Akbari.

*July 31st. Ordinary Meeting.*

A letter from Major H. S. Jarrett, dated 9th July, requesting the Society to undertake the printing of his translation of the Tarikh-ul-Khulfa, was referred to the Philological Committee.

An application from the Adelaide Philosophical Society for an exchange of publications was declined.

*August 28th. Ordinary Meeting.*

A letter from the Under-Secretary to the Government of Bengal, No.  $\frac{1530}{140}$  Misc., dated 13th August, stating that the Lieutenant-Governor approved of the manner in which the Government grant to the Society for the Conservation of Sanskrit MSS. had been spent, was ordered to be recorded.

The receipt of 12 gold coins from the Ahin Posh Tope, presented by the Government of India, Home, Revenue and Agricultural Department, was ordered to be acknowledged with thanks.

It was resolved that Major-General J. T. Walker should be asked to accept the office of President, and that Mr. Wood-Mason be appointed Member of Council, in place of Mr. W. T. Blanford.



The Secretary reported that Mr. Grote had lodged the money, sent for the purchase of a selection from the Freeling Collection of coins, with Messrs. H. S. King and Co., as it was uncertain whether the collection would be sold, unless it could be done so *en bloc*. ●

*October 2nd. Ordinary Meeting.*

An application from the Royal Microscopical Society for an exchange of publications was agreed to.

It was ordered that, as Mr. Blochmann's MSS. could not be found, Captain H. W. Clarke should be informed that he could proceed with the work of translating the 2nd volume of the *Ain-i-Akbari*.

Mr. Westland was appointed Member of Council, and Dr. Hoernle Trustee of the Indian Museum, in place of Mr. T. S. Isaac.

The Minutes of the Council were read on a letter from Major-General J. T. Walker declining the Presidentship of the Society.

It was resolved that Mr. C. H. Tawney should be asked to accept the office.

The thanks of the Society were ordered to be conveyed to Messrs. Grote and Moore for the trouble they had taken in the publication of the 1st Part of the "Descriptions of New Indian Lepidoptera."

*October 16th. Ordinary Meeting.*

A letter was read from the Under-Secretary to the Government of Bengal, No. 972, dated 9th October, forwarding copy of a letter to Mr. G. A. Grierson stating that the Lieutenant-Governor had been pleased to sanction a grant of Rs. 400 to the Society, as a subscription for the number of copies of his *Maithili Grammar* covered by this sum. The letter was ordered to be recorded.

M. E. Renan's name was ordered to be inserted in the list of the Honorary Members.

An advance to Dr. Mitra of Rs. 600 from the Conservation of Sanskrit MSS. Fund to be expended in the search for Sanskrit MSS. was sanctioned.

Mr. Wood-Mason was re-appointed Natural-History Secretary.

A pension of Rs. 4 per mensem was granted to Manu, the office Jamar, who had been in the service of the Society for 25 years.

*November 27th. Ordinary Meeting.*

A letter from the Under-Secretary to the Government of India, Home, Revenue and Agricultural Department, No. 1922, dated 16th October, sanctioning an additional sum of Rs. 1,500 for the cataloguing of the Sanskrit MSS. in the Mahārājā of Bikanir's Library, was ordered to be recorded.

The exchange of the Society's publications for Professor Carl's "Reperitorium für experimental Physik" was sanctioned.

The thanks of the Council were ordered to be conveyed to Mr. Westland for his Memorandum on the proposed change in the Society's accounts, and his scheme was ordered to be adopted from the 1st of January 1880.

On Mr. Tawney's declining to accept the Presidentship of the Society, Mr. H. B. Medlicott was appointed President. Messrs. Tawney and Westland were appointed Vice-Presidents, and Mr. J. Crawford Member of Council and General Secretary.

A Memorandum was submitted by Mr. H. B. Medlicott, showing the progress made in the revision of the new Catalogue.

The whole of the printing of the *Bibliotheca Indica* Series was ordered to be made over to the Baptist Mission Press.

The price of coloured copies of Moore and Hewitson's "Descriptions of New Indian Lepidoptera," Part I, was fixed at Rs. 6, or Rs. 4-8 for Members.

*December 24th. Ordinary Meeting.*

The exchange of the "Academy" for the Society's publications was sanctioned.

An application from the Royal Zoological Society of Amsterdam for an exchange of publications was agreed to.

It was resolved that half the cost of substituting iron pillars for the 4 stone ones formerly supporting the staircase in the Society's Rooms, and which had been made over to the Indian Museum, should be recovered from the Trustees.

Mr. J. Crawford was appointed a Trustee of the Indian Museum, and Mr. J. F. Browne a Member of the Philological Committee.

A recommendation of the Finance Committee, that an increase of Rs. 10 per mensem should be made to the pay of the Assistant Librarian, was approved.

The PRESIDENT then delivered the following address—

*P*RESIDENT'S *A*DDRESS.

GENTLEMEN,

I have already, on the very recent occasion of my nomination, expressed regret that a more suitable President had not consented to stand. I have now only to thank you for the honour you have conferred upon me, and to engage to do my best in performing the duties entrusted to me.

It would be contrary to usage to expect an address from a newly-made President; indeed, as my election is confirmed only this evening, there would be a sort of impropriety in my appearing before you with a ready-made retrospect of work; and my total unreadiness at impromptu speaking,

or indeed any kind of speaking, should have made me again persist in declining a position in which such readiness is more or less essential. The few remarks I have now to make relate only to business.

The suggestion may be traceable to my personal failing, as just now indicated, but in thinking over the Society's welfare and prospects, as your President is bound to do, it has appeared to me with some force of reason that a presidential address is a serious stumbling-block in our case, and, as such, an indicator of a difficulty that threatens the Society. It is the only compulsory work contingent upon membership—excepting, of course, the onerous duties undertaken by our Honorary Secretaries—and it falls upon an office that should under our circumstances be free from any such burden. In the good old times when we were all amateurs, when Sir Edward Ryan and Sir James Colville presided over us, each for ten or more successive years, no such task seems to have been thought of. The innovation is traceable to the advent of the inevitable working man, the professional student. As a member of the brotherhood I may speak of him without offence. He soon introduced the customs of his kind, and set up the didactic business, with the annual display of fireworks over the achievements of the year. I am not prepared to say that the practice is an evil: an occasional taking stock of progress, local or general, (as was done for us last year by Mr. Blanford) is most useful and instructive, and there are sometimes gifted men who can turn every such opportunity to account, but as a regular institution an annual presidential address is everywhere more or less of an incubus, and under certain circumstances may be seriously damaging, as I think it would be with us.

In normal communities scientific societies are mostly restricted to special branches of study, and are sufficiently supported by men more or less devoted to that study, and who think it an honour, and an advantage to belong to the society. For larger societies that deal with all subjects there are also enough and to spare of scientific workers seeking the advantages or the honour of fellowship. If there were any need to illustrate how abnormal is the community to which we belong in India, the statistics of our Society would be much to the point. The relation of the body to the members seems to be almost the reverse of what I have indicated as normal. The very precarious hold the Society has upon its members has always been a complaint, but instead of mending with the advance of civilization, there are signs of its becoming a serious disease. This has been distressingly exhibited of late in connexion with a praiseworthy endeavour made by our administration to get the affairs of the Society into more regular working order. In some instances when notice was sent to members, calling attention to the rules of the Society and stating how long the subscription had been in arrears, while they had been in regular receipt of

the Journal, instead of apologising for their neglect, as a proper sense of the situation would dictate, they have not been ashamed to take offence at the notice, and to request the removal of their name from the list of members. The fact, I say, is a caution against attempting to regulate our practice too closely on the pattern of Societies in a normal community. Except for the unavoidable introduction of a few scientific professional men, the community in India is very much what it was 50 years ago, although habits may have changed; and our Society is now as then very largely composed of members of the several services whose interest in science of any kind is more or less nominal, and who join the Society principally under a vague sense of duty, that, as representatives of a higher civilization, they should contribute to sustain in this country the only free exponent of the basis of that civilization. Several causes have tended to slacken that sense of duty. The greatly increased facilities of intercourse with the mother country, whereby we can have quick enjoyment of many of the privileges of her higher life, tends to obliterate the hitherto sentiment that India is at least our foster mother, that we are here as representative men, with claims upon us that would not apply in the home country. There are around us men who are in a way good representatives of modern intelligence, who, in former times, would certainly have taken an interest if not an active part in this Society, but who now affect to ignore it. On this plea we have a very strong appeal to make: no amount of borrowed light can compensate India for the extinguishing of ever so small a source of independent light within herself. In the good old times when we were all amateurs, several scientific or literary societies in different parts of India managed to exist for various periods; they have long since become extinct; and from the beginning till now our Society has been the only one that has sustained a regular life. Even as compared with many societies in Europe, the career of the Asiatic Society of Bengal has been a distinguished one. It will be a disgrace to Englishmen in India if its sustenance should fall short.

From the statistics of our Society there is a more unfortunate experience to be learned than the danger I have pointed out. That danger might be of no account if indigenous resources had been awakened and developed, but of this there is still but small evidence. However Englishmen may conduct themselves in India, they can never of themselves form the normal community which it is the function of civilization to establish. Superficially it did not seem an unreasonable hope that the seeds of knowledge would take root in this country, and in time yield an abundant crop of native scientific workers, amongst whom this Society would find its natural support. It is not to be doubted that this hope is yet to be realised, but it seems as if the time required for the evolution were to be

reckoned by geological rather than by ordinary life periods. I find indeed the names of some 50 native gentlemen in our list of members, but a very small minority of them are working partners, and these are still exclusively attracted to the less exact branches of research, such as philology and archæology, the cultivation of which studies had been long carried on under indigenous methods. It seems as if a *nidus* for the seed of natural science had not as yet been formed, or else even such teaching as has been given must have borne fruit.

I have twice referred to the age of amateurs; and, from the lips of a 'professional,' it might be thought that the term was meant slightly. I used it as peculiarly designating the bond of fellowship that should unite a Society like ours. The receipt of pay is certainly not exalting: the only conditions to save it from being debasing are, that the work should be congenial, and that no pains should be spared to make it good; and these are the characters that distinguish the amateur. His is a spirit that should make every honest work invigorating. No doubt the title is variously applied; some usurp the name who work only for show; but these should take rank with other quack professors, as the true professional man may lay claim to the position of amateur. It is in this capacity that he is admitted to our Society.

To come back to our starting point: I have made a principal appeal to the moral consciousness of Englishmen in India, but it behoves us to do what we can to conciliate so capricious an auxiliary. If it should come to be thought that the Society is in the hands of, and sufficiently provided for by, devotees in the shape of experts and 'professionals,' we should risk losing the very slight hold we have upon a large number of our members. I do not speak without a knowledge of the subject, and I believe that some such notion has already begun to take effect; and the object of my remarks is to suggest the only remedy I can think of—that we should not disguise our position as amateurs, that we should, if possible, as of old, select our President from those whom the men we have to look to are accustomed to follow. From this point of view the innovation of an annual address is certainly a scare and an impediment: which is the thesis I started with. I am not prepared to say whether it is possible to interfere with what may be an inevitable process of elimination: but that would not affect the accuracy of the diagnosis of our position I have submitted for your consideration.

Although I have uttered a sort of Cassandra warning, it is, I am happy to say, apparent from the report you have heard read that our venerable Society is not yet on the verge of dissolution. The papers presented at our meetings during the past year are of high interest: in terrestrial physics we have heard the results of the very important series of

pendulum observations in India, communicated by General Walker ; and Mr. H. F. Blanford has made several interesting contributions from his studies in meteorology. In applied physics, valuable researches have been exhibited by Mr. Schwendler and by Colonel Tennant, R.E. In natural history, philology, archæology and geography many instructive papers were read and published. As a personal favour, I would ask permission to mention here why there should be a conspicuous absence of geological work in our publications, while the members of the Geological Survey have certainly not been idle members of the Society : it is because the Survey possesses in its Records a quarterly publication of its own, easily obtainable by every one, and in which all work of interest receives prompt notice.

It is in connexion with the Library that members are most wont to complain. While admitting that these complaints are founded on fact, I would emphatically point out that guilty members are chiefly to blame for the grievance. In a Society so old as ours and originally so well set up, the collection of books should now be very valuable ; and so it is ; but irreparable losses have been inflicted by the unconscionable conduct of members, in taking out books and never returning them. The evil is far from extinct ; men seem to think that their book-shelves are to be permanently stocked with works of reference from the Society's Library, and that, as members, they can do just as they please. It seems of little use to make rules, for reference to them is in some cases constantly disregarded. I would earnestly appeal to the sense of our members to be more reasonable in this respect. Another cause of inefficiency is that from which every institution in India is more or less a sufferer—the very frequent change and removal of comptrolling officers who may take a personal interest in the establishment ; and thirdly, there is the great difficulty in India of procuring a permanent salaried officer who is competent for the higher duties of a Librarian. An effort is now being made to get the Library into better order. In every moment that can be spared from routine work, our new Assistant Secretary is engaged in cataloguing and arranging the books upon an approved system.

In the matter of accounts I have to make special mention of the great obligation the Society is under to Mr. J. Westland. Our accounts have no doubt always been effectively comptrolled and audited, but in a very complicated and troublesome manner. Mr. Westland has, with much personal labour, completely re-organised our financial records upon a proper technical system.

I would finally ask you to join me in thanking our Honorary Secretaries for their unwearied attention to the affairs of the Society.

The PRESIDENT announced that the Scrutineers reported the result of the Election of Officers and Council as follows :

H. B. Medlicott, Esq., M. A., F. R. S., F. G. S.,	<i>President.</i>
Dr. Rájendralála Mitra, C. I. E.	} <i>Vice-Presidents.</i>
J. Westland, Esq., C. S.	
C. H. Tawney, Esq., M. A.	
J. Wood-Mason, Esq.	} <i>Secretaries and Treasurer.</i>
Dr. A. F. R. Hoernle.	
J. Crawford, Esq., C. S.	
H. Beverley, Esq., C. S.	} <i>Members of Council.</i>
H. B. Medlicott, Esq., F. R. S.	
Dr. Rájendralála Mitra, C. I. E.	
J. Westland, Esq., C. S.	
C. H. Tawney, Esq., M. A.,	
Major-General J. T. Walker, F. R. S.	
D. Waldie, Esq., F. C. S.	
A. W. Croft, Esq., M. A.	
H. F. Blanford, Esq., F. G. S.	
Babu P. C. Ghosha, M. A.	
Dr. T. R. Lewis.	
L. Schwendler, Esq.	
J. Wood-Mason, Esq.	
Dr. A. F. R. Hoernle.	
H. Beverley, Esq., C. S.	
J. Crawford, Esq., C. S.	

Messrs. J. Douglas and J. Westland were appointed to audit the annual accounts.

The Meeting was then resolved into the Ordinary Monthly General Meeting.

H. B. MEDLICOTT, Esq., F. R. S., President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From Mrs. G. H. Damant,—Gaur: its Ruins and Inscriptions. By J. H. Ravenshaw.
2. From Dr. D. B. Smith,—2 Astronomical Charts.
3. From the Meteorological Reporter to the Government of India,—Register of Original Observations in 1879, reduced and corrected. January 1879.
4. From the Chief Secretary to the Madras Government,—two silver coins.

The following gentlemen, duly proposed and seconded at the last meeting, were ballotted for and elected Ordinary Members—

The Hon'ble Arthur Wilson. Behárilál Gupta, Esq., c. s.

The following are candidates for ballot at the next meeting—

1. Lieut. R. C. Tufnell, 30th Madras Infantry, proposed by M. Longworth Dames, Esq., c. s., seconded by Dr. A. F. R. Hoernle.

2. Ramesvar Maliah, Esq., proposed by Dr. R. Mitra, seconded by J. Crawford, Esq.

3. A. C. Carlleyle, Esq., proposed by Dr. A. F. R. Hoernle, seconded by J. Crawford, Esq.

The SECRETARY reported that Dr. R. A. Barker had compounded for his future subscriptions.

The COUNCIL reported that Mr. Wood-Mason had been elected Member of Council on the 28th August, and had been re-appointed Natural-History Secretary on the 16th October.

The SECRETARY read the following letter from Col. J. F. Tennant, F. R. S., drawing the attention of the Society to the 1st Part of Vol. I of Professor Newcomb's "Astronomical Papers for the use of the American Nautical Almanac :"—

"I should like to draw the attention of members of the Asiatic Society who may be interested in Ancient Chronology depending on Solar Eclipses, to the First Part of Vol. I of 'Astronomical Papers for the use of the American Nautical Almanac.' It is published in 1879 at Washington.

"The author, Professor Newcomb, Superintendent of the Almanac, has recently been engaged in comparing Hanssen's Lunar Tables with the records of old eclipses, and he has arrived at certain results as to the corrections required to satisfy observation. In the work I mention (a quarto of 56 pages), he has given an investigation of the laws of the recurrence of eclipses, and obtained some relations not generally known or appreciated. Aided by these, and taking Hanssen's Tables as a basis, he has given tables which enable one to ascertain, in a very short time, what eclipses occur in any year between B. C. 700 and A. D. 2300, and to recognize their nature. Further tables enable one to compute, with great ease, the fundamental numbers required for computing the phenomena of the eclipse by Bessel's method.

"All the results are approximate, but, when dealing with ancient records, these approximations are sufficient, and, even in modern times, the tables will give accuracy enough to enable one to know the character of an eclipse and the rough limits of its several phases."



The following papers were read :—

1. *A History of the Fossil Vertebrata of India.*—By R. LYDEKKER, B. A.

The author requested that this paper might be taken as read, as it was too long to be read *in extenso* at the meeting. He remarked that the history of the fossil vertebrates of India was intimately connected with the Asiatic Society of Bengal, and it was, therefore, appropriate that a sketch of the state of our knowledge of the subject should be presented to the public through the Society.

This paper will be published in the Journal of the Society, Part II, No. 1 for 1880.

2. *On the Zoological Position of the Barhal, or Blue-Sheep of Thibet.*—By R. LYDEKKER, B. A.

(Abstract.)

The author showed that the characters of the skull and horns in this animal indicated closer relationship with the goats than with the sheep, while the external characters were closer to those of the sheep, and concluded that Hodgson's genus *Pseudois* should be retained for the 'barhal.'

This paper will be published in the Journal, Part II.

Mr. Wood-Mason made a few remarks on this paper.

3. *An Account of the Verification in part of a set of Standard Weights, and the Relative Values of the Series of Weights in use.*—By COL. J. F. TENNANT, R. E., F. R. S., *Master of the Mint.*

(Abstract.)

This paper describes the method by which a portion of the weights of an English Bullion set have been compared, and their values found in terms of a Standard Ounce, known in terms of the English Standard Pound. Colonel Tennant has given full details, showing how the comparison and evaluation can be systematically carried out in some cases, and how an exceptional case can be dealt with. He has everywhere kept a record of the probable errors generated in his procedure, and has endeavoured to make his paper such that it may serve as a guide to any one who may have to verify weights. Tables are given in the appendix which are necessary to reduce the results of weighings in air to what they would have been in a vacuum, and in determining specific gravities.

Lastly, Colonel Tennant compares the advantages of several systems of weights, and discusses the best value of a Standard weight and describes the results he has arrived at, and by which he has been guided, in making arrangements for a set of Standard Tolah weights for the Mint.

This paper will be published in the Journal, Part II

4. *Rude Megalithic Monuments in North Arcot.*—By LIEUT.-COL. B. R. BRANFILL. Communicated by MAJOR-GENERAL J. T. WALKER, R. E., C. B., F. R. S.

(Abstract.)

The tombs described in this paper are of unusual interest on account of the size, shape and arrangement of the slabs of which they are composed, and the rarity of their chief characteristic.

They are 30 feet in diameter, and consist of 3 concentric rings of upright stone slabs, half of them being semicircular at top. The three rings are of various heights, the outermost being 3 feet, the innermost 12 or 15 feet high, above the cairn. The whole forms an imposing structure and recalls the idea of a small citadel or fortification. On excavating, the usual sepulchral relics were found in them, except that iron weapons were very scarce. The chief novelty to the author were two or three Tamil letters, found scratched on a fragment of a little bowl.

This paper will be published in the Journal, Part I.

5. *Supplementary Note to the Paper on the Coins of the Sunga or Mitra Dynasty.*\*—By A. C. CARLLEYLE, Esq., of the *Archæological Survey*.

(Abstract.)

This paper describes another, apparently *unique*, coin of a king of the Sunga dynasty, called Ayu-mitra. He must have been one of the latest of the dynasty, as the letters of the legend belong to the later Gupta period. The obverse shows a bull, with the inscription underneath, "ayu-mitasa;" the reverse apparently has a peacock and palm-tree.

This paper will be published in the Journal, Part I.

The following communication has been received—

*Remarks on the Afghans found along the route of the Tal Chotali Field Force in the spring of 1879.*—By LIEUT. R. C. TEMPLE, B. C. S., F. R. G. S., M. R. A. S.

\* See Proceedings for January 1880.

## LIBRARY,

The following additions have been made to the Library since the Meeting held in January last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,  
presented by the respective Societies and Editors.

Berlin. K. preuss. Akad. der Wissenschaften,—Monatsbericht, September and October 1879.

Bombay. The Indian Antiquary,—Vol. VIII, Nos. 100, 101; Vol. IX, No. 102: December 1879 and January 1880.

Bordeaux. Société de Géographie Commerciale,—Bulletin, No. 24, 15th December 1879, and No. 1, 5th January 1880.

Calcutta. Mahābhārata,—No. 42.

The Hague. K. Instituut voor de Taal-Land-en Volkenkunde van nederl. Indië,—Bijdragen, Vol. III, Nos. 1 and 2.

Hanover. Geographische Gesellschaft,—Erster Jahresbericht, 1879.

London. Athenæum,—Nos. 2721—2725.

———. Geological Society,—List of Fellows on November 1st, 1879.

———. ———. Quarterly Journal, Vol. XXXV, Part 4, November 1879.

———. Institution of Mechanical Engineers,—Proceedings, No. 4, August 1879.

———. Nature,—Vol. XXI, Nos. 529, 531, 533.

———. Royal Astronomical Society,—Monthly Notices, Vol. XL, No. 1, November 1879.

*Herschel, Major.*—Note on the Difference of Variation of Gravity at Revel and St. Petersburg; and on Grischow's Pendulum Observations at other stations.  
*Draper, Prof. J. C.*—On a Photograph of the Solar Spectrum, showing Dark Lines of Oxygen.

———. Royal Geographical Society,—Proceedings, Vol. I, No. 12, December 1879.

———. Royal Microscopical Society,—Journal, Vol. II, No. 7, December 1879.

*Mayall, J.*—Immersion Stage Illuminator. Record of Current Researches relating to Invertebrata, Cryptogamia, Microscopy, &c.

Munich. Repertorium für Experimental Physik,—Vol. XV, No. 12, 1879.

Palermo. Società degli Spettroscopisti Italiani,—Memorie, Disp. 8, August 1879.

- Paris. *Journal Asiatique*,—Vol. XIV, No. 2, August—September 1879.  
 ———. *Société d'Anthropologie*,—Bulletin, Vol. II, No. 3, April—July 1879.  
 ———. *Société de Géographie*,—Bulletin, November 1879.  
 ———. *Société Zoologique de France*,—Bulletin, Parts 5 & 6 for 1878, and Parts 1 to 4 for 1879.  
     1879. *Bureau, Dr. L.*—Recherches sur la mue du bec des oiseaux de la famille des Mormonidés.  
 Pisa. *Società Toscana di Scienze Naturali*,—Processi Verbali, Adunanza del di 9 Novembre 1879.  
 Roorkee. *Professional Papers on Indian Engineering*,—Vol. IX, No. 35, January 1880.  
 Washington. *Geological and Geographical Survey of the Territories*,—Bulletin, Vol. V, Nos. 2 and 3.

### MISCELLANEOUS PRESENTATIONS.

- Report on the Administrations of the License Tax in Bengal for 1878-79. Fcp., Calcutta, 1879.  
 Records of the Geological Survey of India,—Vol. XII, Part 4, 1879.  
*Waagen, Dr. W.*—Note on the "Attock Slates" and their probable Geological Position. *Theobald, W.*—On a Marginal Bone of an undescribed Tortoise, from the Upper Siwaliks, near Nila in the Potwar, Punjab. *Foot, R. B.*—Sketch of the Geology of the North Arcot District. *Wynne, A. B.*—On the Continuation of the Road Section from Murree to Abbottabad.

#### BENGAL SECRETARIAT.

- RAVENSHAW, J. H. *Gaur ; its Ruins and Inscriptions*. Fol., London, 1878.  
 MRS. G. H. DAMANT.

Report on the Administration of the North-West Provinces and Oudh for the year ending March 31st, 1879. 8vo., Allahabad, 1879.

#### GOVT. OF THE NORTH-WEST PROVINCES.

The Indian Antiquary,—Parts 100, 101 and 102.

#### HOME, REVENUE AND AGRIC. DEPT.

Registers of Original Observations in 1879, reduced and corrected. January 1879.

#### METEOR. REPORTER TO THE GOVT. OF INDIA.

### PERIODICALS PURCHASED.

- Calcutta. *The Calcutta Review*,—No. 139, January 1880.  
 ———. *The Indian Medical Gazette*,—Vol. XV, No. 2, February 1880.  
 Geneva. *Archives des Sciences physiques et naturelles*,—Vol. II, No. 12. 15th December 1879.  
 Giessen. *Jahresbericht über die Fortschritte der Chemie*. 1879, Part II.

- Göttingen. Gelehrte Anzeigen,—Nos. 49—51.  
 ———. Nachrichten,—No. 17.  
 Leipzig. Annalen der Physik und Chemie,—Vol. VIII, Part 4.  
 ———. Beiblätter,—Vol. III, No. 12.  
 London. The Academy,—Nos. 398—402.  
 ———. Journal of Botany,—Vol. VIII, No. 204, December 1879.  
     *Hartig, M. M.*—Notes on *Sapotaceæ*.—II.  
 ———. British Association for the Advancement of Science,—Report of the Meeting held at Sheffield, in August 1879.  
 ———. The Chemical News,—Vol. XL, Nos. 1047, 1048; Vol. XLI, Nos. 1049—1051.  
 ———. The Entomologist,—Vol. XII, No. 199, December 1879.  
 ———. The Entomologist's Monthly Magazine,—Vol. XVI, No. 187.  
     *Lewis, G.*—Diagnoses of new *Elatерidae* from Japan. *Gosse, P. H.*—Singular occurrence in a Dipterous insect.  
 ———. The Ibis,—Vol. III, No. 12, October 1879.  
     *Seebohm, H.*—Remarks on certain Points in Ornithological Nomenclature. *Tristram, H. B.*—On a Collection of Birds from the Solomon Islands and New Hebrides. *Wardlaw-Ramsay, R. G.*—Ornithological Notes from Afghanistan,—No. I. *Wharton, H. T.*—On the Orthography of some Birds' Names. *Marshall, G. F. L.*—On a new Pheasant from the North-West Himalayas. *Gurney, J. H.*—Notes on a "Catalogue of the Accipitres in the British Museum," by R. B. Sharpe. On the Occurrence of *Ninox borneensis* in Java, and of a large Form of *Scops lempiji* in Sumatra. *Layard, E. L.*—On a new Thrush from the Loyalty Islands Group. *Salvadori, T.*—On a new Hawk of the Genus *Urospizias*, Haup, from Bourou.  
 ———. The Annals and Magazine of Natural History,—Vol. IV, No. 24, December 1879.  
     *Staden, W. P.*—On the Structure of *Astrophisura*, a new and aberrant Genus of *Echinodermata*. *Butler, A. G.*—Descriptions of new Species of Lepidoptera from Japan. *Ridley, H. N.*—On a new Copepod of the Genus *Doridicola*. *Lewis, G.*—On certain new Species of *Coleoptera* from Japan.  
 ———. The Nineteenth Century,—Vol. VI, No. 34, December 1879.  
 ———. The Numismatic Chronicle,—Vol. XIX, Part 3, 1879.  
 ———. The London, Edinburgh and Dublin Philosophical Magazine,—Vol. VIII, Nos. 51 and 52.  
     No. 51. *Nichols, E. L.*—A new explanation of the Colour of the Sky. *Hutchinson, C. C.*—On the Separation and Estimation of Cadmium in the presence of Zinc; with Remarks upon the Separation of Copper, Cadmium and Zinc. *Rosetti, F.*—Experimental Researches on the Temperature of the Sun. *Rayleigh, Lord.*—Investigations in Optics, with special reference to the Spectroscope.  
     No. 52. *Rosetti, F.*—Experimental Researches on the Temperature of the Sun. *Hunt, R.*—On the Influence of the Solar Rays on Vegetation. *Schwendler, L.*—On a Simple Method of using an insignificant Fraction of the Main Current produced by a Dynamo-electric Machine for Telegraph Purposes.

London. The Publishers' Circular,—Vol. XLII, Nos. 1014 and 1015.

———. The Monthly Journal of Science,—Vol. I, No. 72, December 1879.

The Action of Light on Plants. Are the Chemical Elements Simple Bodies? Darwinism and Articulate Speech.

———. Journal of the Society of Arts,—Vol. XXVIII, Nos. 1413—1417.

New Haven. The American Journal of Science and Arts,—Vol. XVIII, Nos. 106—108, October—December 1879.

No. 106. *Draper, H.*—Coincidence of the Bright Lines of the Oxygen Spectrum with Bright Lines in the Solar Spectrum.

No. 107. *Marsh, O. C.*—History and Methods of Palæontological Discovery. New Jurassic Mammals.

No. 108. *Draper, H.*—Photographing the Spectra of the Stars and Planets. *Brooks, W. K.*—Artificial Fertilization of Oyster Eggs, and Embryology of the American Oyster. *Broadhead, G. C.*—Origin of the Læss. *Marsh, O. C.*—New Jurassic Reptiles.

Paris. Annales de Chimie et de Physique,—Vol. XVIII, November 1879.

———. Comptes Rendus,—Vol. LXXXIV, Nos. 7 and 17; Vol. LXXXV, Nos. 6, 17 and 26; Vol. LXXXVII, Nos. 2 and 21; Vol. LXXXIX, Nos. 23—26; Vol. XC, No. 1.

———. ———. Index to Vols. LXXXVI and LXXXVIII.

———. Journal des Savants,—Vol. for 1839, and No. for December 1879.

———. Revue Critique,—Vol. VIII, Nos. 50—52; Vol. IX, Nos. 1 and 2.

———. Revue des deux Mondes,—Vols. XCIX and CIV; Vol. XXXVI, Part 3; Vol. XXXVII, Parts 1 and 2.

———. Revue Scientifique,—Vol. XVII, Nos. 24—26; Vol. XVIII, Nos. 27 and 28.

### BOOKS PURCHASED.

BROCA, P. Instructions craniologiques et craniometriques. 8vo., Paris, 1875.

CANDOLLE, A. P. DE. Prodromus Systematis Naturalis Regni Vegetabilis. 17 Vols. 8vo., Paris, 1824-73.

CANDOLLE, A. & C. DE. Monographie Phanerogamarum Prodromi nunc continuatio, nunc revisio, 2 Vols. 8vo., Paris, 1878-79.

CHENU, DR. J. G. Manuel de Conchyliologie et de Paléontologie conchyliologique. 2 Vols. Rl. 8vo., Paris, 1859-62.

FREDEBICI, KARL. Bibliotheca Orientalis pour 1878. Sm. 4to., Leipzig, 1879.

HELMHOLTZ, H. Théorie physiologique de la Musique. 8vo., Paris, 1874.

MEZŐ-KÖVESD, CH. E. UJFALVY DE. Atlas Anthropologique des Peuples de Ferghanah. Svo., Paris, 1879.

Parliamentary Papers. East India (Silver). No. 369. Fol., London, 1879.

SCHEFER, Ch. Relation de l'Ambassade au Kharezme de Riza Qouly Khan. Svo., Paris, 1879.

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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL,  
FOR MARCH, 1880.

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The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 3rd instant, at 9 P. M.

DR. RAJENDRALALA MITRA, Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Home, Revenue and Agricultural Department,—(1) Selections from the Records of the Government of India, Home, Revenue and Agricultural Department, Nos. CLIX and CLX, (2) The Stūpa of Bharhut: by Major General A. Cunningham, (3) A Comparative Grammar of the Modern Aryan Languages of India. Vol. III. The Verb: by J. Beames, and (4) Hindu Tribes and Castes. Vol. II: by Rev. M. A. Sherring.

2. From the British Museum,—Descriptions of new species of *Hymenoptera* in the collection of the British Museum; by Frederick Smith.

3. From the K. Institut voor de Taal-Land-en Volkenkunde van Nederl. Indië,—Reizen naar Nederlandsch Nieuw Guinea in de jaren 1871, 1872, 1875-76; by P. J. B. C. Robidé van der Aa.

4. From the Government, N. W. P.,—(1) Statistical, Descriptive and Historical account of the North West Provinces of India. Vol. V. Rohilkhand Division, Part I: by H. C. Conybeare, edited by E. T. Atkinson, (2) List of Sanskrit MSS. discovered in Oudh during the year 1879: by Pandit Devi Prasad.

5. From the Translator,—Vikramorvaçi, ourvaçi donnée pour prix de l'heroïsme: drame en cinq actes de Kalidasa. Traduit du Sanscrit par Ph. Ed. Foucaux.

6. From the Nantisk Meteor. Byran i Stockholm,—(1) Instruktion för Meteorologiska Observationers Utförande vid Svenska Fyrstationer, (2)



Instruktion för Meteorologisk Loggboks Förande, (3) Instruktion för Hydrographiska Observationers ut Förande vid Svenska Fyr-och Lots-Stationer.

7. From the K. K. Geol. Reichsanstalt in Wien,—Zur Kenntniss der Fauna des untersten Lias in den Nordalpen : by Dr. M. Neumayr.

8. From the Authors:—(1) Report on the miscellaneous old Records of the India Office, Nov. 1st 1878 : by Dr. G. Birdwood. (2) Sanskrit Wörterbuch in kürzerer Fassung. Erster Theil. Die vocale : by Otto Böhtlingk, (3) Morphological notes bearing on the origin of Insects : by J. Wood-Mason, (4) Essays on the Language, Literature and Religion of Nepál and Tibet : by B. H. Hodgson.

9. From the Marine Survey Department,—List of Light-Houses and Light-Vessels in British India : by R. C. Carrington.

10. From the St. Xavier's College Observatory,—A Statement of the Results of the Observations made from July to December, 1879.

11. From the Muséum d'Histoire Naturelle de Lyon,—Recherches sur les mastodontes et les faunes mammalogiques qui les accompagnent : by Dr. Lortet and E. Chantre.

12. From the K. Akademie der Wissenschaften in Wien,—Zweite Abhandlung über die Wasserabnahme in den Quellen, Flüssen und Strömen : by Gustav Ritter von Wex.

13. From the Secretary of State for India,—The Bondage and Travels of Johann Schiltberger : by Commander J. B. Telfer.

The following Gentlemen, duly proposed and seconded at the last Meeting, were balloted for and elected Ordinary Members—

Lieut. R. C. Tufnell.

A. C. Carlleyle, Esq.

Ramesvar Maliah, Esq.

The following Gentlemen are candidates for ballot at the next Meeting—

1. W. Fiddian, Esq., Rampur Beaulieu, proposed by E. V. Westmacott, Esq., seconded by J. Crawford, Esq.

2. N. Elias, Esq., proposed by H. B. Medlicott, Esq., seconded by R. Lydekker, Esq.

3. Bábu Bipina Chandra Rai, proposed by Dr. Rájendralála Mitra, seconded by Bábu Pratápa Ch. Ghosha.

4. Ananda Ráma Gajapati, Rájá of Vizianagram, proposed by Rájá Satyánanda Ghoshál, seconded by Moulvie Abdul Latif Khán Bahadur.

The SECRETARY reported that Major W. R. M. Holroyd had requested that his withdrawal might be cancelled.

The SECRETARY read the names of the following Gentlemen appointed

by the Council to serve on the several Committees during the ensuing year:—

FINANCE COMMITTEE.

J. Westland, Esq., C. S.  
Dr. Rájendralála Mitra, C. I. E.  
J. C. Douglas, Esq.  
H. Beverley, Esq., C. S.

LIBRARY COMMITTEE.

Dr. Rájendralála Mitra, C. I. E.  
Col. J. F. Tennant, R. E.  
Major-General J. T. Walker, F. R. S.  
Dr. D. D. Cunningham.  
Dr. W. K. Waller.  
A. W. Croft, Esq., M. A.  
C. H. Tawney, Esq., M. A.  
Hon'ble Whitley Stokes, C. S. I., C. I. E.  
Bábu Prannath Pandit, M. A.  
H. F. Blanford, Esq., A. B. S. M., F. G. S.  
G. Nevill, Esq.  
Dr. O. Feistmantel.  
J. Eliot, Esq., M. A.  
A. Pedler, Esq.  
H. Beverley, Esq., C. S.  
Dr. Mohendralála Sircár.  
J. C. Douglas, Esq.  
Bábu Protápa Chandra Ghosha, B. A.  
Dr. T. R. Lewis.

PHILOLOGICAL COMMITTEE.

Dr. Rájendralála Mitra, C. I. E.  
C. H. Tawney, Esq., M. A.  
Major-General A. Cunningham, C. S. I.  
J. Beames, Esq., B. C. S.  
F. S. Growse, Esq., M. A., C. S., C. I. E.  
Rev. K. M. Banerjea, LL. D.  
Babu Gaur Dás Bysack.  
Dr. Mohendralála Sircár.  
Hon'ble J. O'Kinealy, C. S.  
Hon'ble Whitley Stokes, C. S. I., C. I. E.  
Dr. G. Thibaut.

H. Rivett-Carnac, Esq., C. S., C. I. E.  
Moulvie Abdul Latif Khán, Bahádur.  
Moulvie Kabiruddin Ahmad.  
Babu Dijendranath Thakur.  
Bábu Prannath Pandit, M. A.  
Babu Protápa Chandra Ghosha, B. A.  
Captain H. W. Clarke, R. E.  
Major H. S. Jarrett.  
J. F. Browne, Esq., C. S.

## NATURAL HISTORY COMMITTEE.

Dr. O. Feistmantel.  
Dr. D. Waldie.  
A. O. Hume, Esq., C. S.  
G. Nevill, Esq.  
Dr. D. D. Cunningham.  
Dr. J. Armstrong.  
Dr. G. King.  
Dr. W. Schlich.  
Dr. D. Brandis.  
S. E. Peal, Esq.  
W. E. Brooks, Esq., C. E.  
R. Lydekker, Esq., B. A.  
Capt. G. F. L. Marshall, B. E.  
Lieut. F. W. Jarrad, R. N.  
L. Schwendler, Esq.  
Dr. T. R. Lewis.

## PHYSICAL SCIENCE COMMITTEE.

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Dr. D. Waldie.  
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A. Pedler, Esq.  
A. Cappel, Esq.  
J. Eliot, Esq., M. A.  
Col. J. F. Tennant, F. R. S.  
Commander A. D. Taylor.  
Dr. O. Feistmantel.  
R. Lydekker, Esq., B. A.  
Hon'ble J. O'Kinealy, C. S.  
J. C. Douglas, Esq.  
F. Fedden, Esq.

## COINS COMMITTEE.

Dr. Rájendralála Mitra, C. I. E.

Col. J. F. Tennant, F. R. S.

Rev. M. A. Sherring.

Major-General A. Cunningham, C. S. I.

Col. F. W. Stubbs.

H. Rivett-Carnac, Esq., C. S.

DR. HOERNLE exhibited 12 Arakan coins, two of which belong to the Phayre Museum in Rangoon, and ten to the Indian Museum in Calcutta. They are described in the following note by Dr. Rájendralála Mitra.

Coins of this class were first brought to the notice of the Society by Capt. J. Latter in 1846. Four specimens were then figured and described (*Journal*, Vol. XV, plate III), two of which bore no inscription, and the inscriptions on the other two were not read. Capt. Latter called them 'Symbolical coins of Arakan.' In 1872, Capt. Fryer obtained two other specimens, and, in the note which he communicated to the Society on them, (*Journal*, XLI, pp. 201 f) he described them as belonging to the Vaisáli dynasty of Arákán. The inscriptions on them and on Capt. Latter's coins were read by Bábu Pratápachandra Ghosha. One he read *Dharmachandra*, another *Srí-ta-chandra* and a third *Srí-vikrama*. All these coins had a couchant bull on the obverse, and a conventional trident (*trísúla*) on the reverse. In 1878, Mr. Blochmann obtained from the Phayre Museum at Rangoon, five specimens of this class of money, bearing on the obverse a conch-shell, instead of the couchant bull, and I read the name on them to be Vijaya, taking Bábu Pratápachandra Ghosha's reading of Srívikrama to be erroneous. The first name I took to be correct, but I could make nothing of the second (*Proceedings* for 1878, pp. 102-3.) The several specimens now obtained enable me to settle its reading and also to supply a new name. The first letter on No. 1 of the Phayre Museum specimens is unquestionably *Srí*, as read by Bábu Pratápachandra Ghosha. It is pronounced by the Arákánese and the Burmese as a word of two syllables, *Síri*. The second letter, read *tí* by Bábu Pratápachandra Ghosha, appears in most of the specimens like *te*, for the mark for *i* is generally left slanting upwards and backwards, whereas that for *e* is curved downwards, and this downward curvature is distinct on some specimens. A dot over the *t* is also perceptible, and that makes the word *teñ*. The last word *Ohandra* is unquestionable. The result is *Srí-teñ-chandra*, and this is the name of the seventh prince of the Vaisáli dynasty of Arákán. In the Burmese style the name is written *Siri taing chandra*. The prince lived, according to Capt. Fryer, in A. D. 903. The letters of the name are of about this date, *i. e.*, the Gupta type merging into the Kuṭila.

The letters on No. 2 of the Phayre Museum and on most of the Indian Museum specimens are older, being somewhat like the old Pálí\* of the Laṭ inscriptions. They are also fairly legible, except the first, which is very like a *t*, but I think it is intended for an *s*. Reading it as *t* the name would be *tari kádu*, and as *s*, *Siri-kádu*. The last is what I take to be the right reading, for it corresponds with the name of the second rájá of the Arákán kings as given in Mr. Paton's list, published in the XVIth Volume of the *Researches*. The name there is written Sorea kádu, and the prince is said to have lived in A. D. 755 = Mug era 117.

Of Vijaya and Dharma-chandra I have not been able to find out the dates; but from the character used on their coins I infer that they must have lived between the dates of Kádu and Teñ-chandra. The *j* of Vijaya is of an older type than the *dh* of Dharma-chandra. Arranged chronologically, Sirikádu comes in 755 A. D.; Vijaya after him, some generations removed; Dharma-chandra third, again some unknown generations removed; and Siri-teñ-chandra in 903 A. D.

Dr. Hoernle remarked, with regard to this note, that the date assigned to Siri kádu which was based on a comparison of the Mug era with the Christian, appeared to be doubtful, as the form of the letters on his coins seems to be of a much older type, *viz.*, of the 2nd or 3rd century, A. D.

Dr. HOERNLE exhibited the Rubbing of a Persian Inscription from Kashmir, sent by Mr. A. Constable, who writes that the inscription is on a slab of black slate, well polished and finished, measuring 21½ by 12 by 2½ inches. He found the slab lying on the ground near the ruins of a Musjid on "Lanka Island," in the Wolar Lake in Kashmir. The copy was taken in September 1874. The Inscription is as follows :

این بقعه چو بنیان فلک محکم باد      مشهور بزین دیب در عالم باد  
شہ زین عباد تا در و جشن کند      پیوستہ چو تاریخ خودش خرم باد

Major Jarrett in a note which was read to the meeting, translates it:—

"May this edifice be as firm, as the foundations of the Heavens,  
May it be the most renowned ornament of the Universe,  
As long as the Monarch Zayn Ibád holds festival therein,  
May it be like the date of his own reign—happy."

The word, translated "happy," is in the original, *Khuram*, the numerical value of the letters of which is 847, meaning that year of the Hijra era, equal to A. D. 1443-4. At that time Zayn Ibád or, as he is commonly

\* The Pálí letters, as constituents of a classical alphabet associated with the Pálí religious books, and not used for the ordinary affairs of every-day life, were not subject to those influences which lead to deterioration, and therefore retained their primitive forms longer in Burmah than elsewhere.—R. M.

called, Zayn ul Aʿbidin was ruler of Kashmir. He was a son of Sultān Sikandar, and succeeded his brother ʿAlī on the throne of Kashmir in A. H. 828 or A. D. 1424-5. In earlier life he had been, for some years, a captive of Timur in Samarkand, from whence, on his return, he introduced various new industries in his own country. His reign was a prosperous and peaceful one. He artificially constructed the island of Lanka in the Woolar lake and built a mosque on it. On the completion of Lanka, the king ordered a great festival to be held. Verses were written by the poets to commemorate this event, and among these the inscription under notice by Ahmad Allāmah Kashmīrī was engraved upon a stone and placed above the Mihrāb, or Sanctuary of the Mosque.

This inscription, together with Major Jarrett's note, will be published in the Journal, Part I.

Dr. HOERNLE exhibited an eye-copy of a Pālī rock-cut inscription sent by Mr. A. M. Markham, Collector of Allahābād, and discovered by him in a cave near the falls of Keoti Kuṇḍa on the river Mahānā, a tributary of the Tanwas or "Tonse" in the Riwa State. The inscription is as follows :

हरिती पुत्रेण साउनकेन कारिता पुच्छरिनी

and means : "the Pool-cave caused to be made by Śaunaka the son of Haritī." The cave takes its name "Pool" from a very picturesque natural pool, excavated by the fall of the Mahānā river, which precipitates itself over a perpendicular drop of 336 feet, unbroken even by a crag. In another cave, near another somewhat similar fall, there are said to be several square yards of very well painted figures and hunting and battle scenes, in a rather bright red.

The following papers were read—

#### 1. *Zoological Notes.*—By L. SCHWENDLER.

The very successful trial of punkha-pulling by means of compressed air, which I had an opportunity of witnessing on the 27th January 1880 at Fort William, Calcutta, where my friend the Honorable C. E. Parsons has introduced his ingenious invention in the Dalhousie Barracks ; and my own endeavours to devise a practical method for pulling Pankhas, *viz.*, by the transmission of power conveyed by the electric current as produced by the present dynamo-electric machines ;\* reminded me again of an interesting fact which I was told some years ago, *i. e.*, that the Langur monkeys of India (*Semnopithecus Entellus*), if the necessary trouble is taken, could be made useful and cheap substitutes for the ordinary punkha-coolies at present generally in use in India.

\* Philosophical Magazine (Supplement), December 1879, and Part II of the Journal, Asiatic Society of Bengal, 1879.

My trustworthy informant, Bábu B. Pyne, a member of the Government Telegraph Department, kindly placed at my disposal the following statement on the subject. The Babu says:—

"Some years ago I had a Langur which, when standing erect, measured fully 2' 6." The animal was very powerful, and could easily pull a punkha measuring 8' in length. It was a male, and, even when young, showed a disposition to be highly savage. The older he got the more savage he became. Seeing the great power this monkey had, I wanted to utilize it, and therefore intended to employ him for the purpose of pulling punkhas. The teaching I effected in the following manner:—the monkey was tied by the waist close to a strong pole, so that it could not move either backwards or forwards, or right or left. Both hands were tied to a rope attached to a punkha which was regularly pulled from the other side by a man. Thus the animal had to sit in one place, and could only move its hands up and down with the punkha rope.

"In this way the monkey, in a comparatively short time, learnt to pull the punkha by himself, and was so employed by me for several years. He always kept in first rate health, enjoyed his work immensely, and did it equally well, if not better, than a cooly. During the rains he suffered from fever and ultimately died. Putting now this trained monkey in the place where the man used to pull the punkha, and a new Langur in the place where the trained monkey formerly sat, I attempted to teach successively *four* more monkeys, two of which were females. I succeeded perfectly in teaching the males, but was quite unsuccessful with the females."

I thought this might be of interest to the Society, since it appears to me the first authentic record of the power of a monkey having been employed for doing *useful work*. There is a certain amount of intelligence required to do this work, since the arms, in their up and down movements, have to keep time with the swinging punkha.

When the reading of the above paper was concluded, Mr. Schwendler mentioned some other instances in which the display of intelligence by monkeys had been noticed. In particular, he mentioned a case in which a monkey, which had sustained a fall from trusting to a rotten branch while swinging on a tree, had been observed afterwards to examine the branches of the tree, and to break off those which it found to be rotten. Some discussion ensued as to whether the action of the monkey in this case was the result of intelligence, and some of the members present were of opinion that it might have been the result simply of anger caused by the fall. Mr. Schwendler, however, stated that he had for long made the habits of animals a study, and that he was convinced of the fact that monkeys were possessed of much intelligence; and he vouched for the authenticity of the statements made in the paper read regarding the monkeys which were taught to pull a punkha.

*Remarks on the Afghans found along the Route of the Tal Chotiali Field Force, in the Spring of 1879.*—By LIEUT. R. C. TEMPLE, B. S. C., F. R. G. S., M. R. A. S., &c. (With two maps and various sketches.)

(Abstract.)

This is the last of a series of papers on subjects connected with the Afghans, written by the author and communicated to various Societies.\* After a few remarks on the geography of the route, which is illustrated by two maps, the author proceeds to review the well-known account of the Afghans of their own origin from a Jewish source, and next to describe in detail the history and peculiarities of the various tribes and clans of Afghans. This is followed by several chapters on the distribution of the Afghan tribes, their polity, their civilization, and their language† as illustrated by their place-names.

This paper will be published in the Journal, Part I.

*Coins Supplementary to Thomas' "Chronicles of the Pathan Kings."*—By CHAS. J. RODGERS, Esq, Principal, Normal College, Amritsar. (With two Plates.)

(Abstract.)

The Chronicles of the Pathan kings is a very full work, but naturally is not exhaustive. Continued search brings out further coins which from time to time have to be described. In the present paper, the author describes about forty coins, which are believed to be as yet unpublished.

This paper will be published in the Journal, Part I.

*Specimens of Balochi Poems, transcribed in Roman characters, and translated, with Explanatory Notes.*—By M. LONGWORTH DAMES, Esq., C. S.

(Abstract.)

These poems are widely spread in the Balochi country where they are recited by the bards, called *Doms* or *Loris*, to accompanying airs or chants. They are current in slightly differing versions. It is probable that they are of considerable age; for they contain many antiquated grammatical forms, and their versification is loose and formless. The paper gives three of these poems, entitled: "The Wanderings of the Rind Balochis," "The Quarrel of Mir Chákar and Gwaharám," and "Dostem and Shiren." The second is only one part of an extensive cycle of poems relating to Mir Chákar, who the great legendary hero of the Rind Balochis and is represented by them

\* See Journal, A. S. B., for 1879.

† The best Grammar on the Pashtu Language is one by Dr. Ernest Trumpp, first published in the Journal of the German Oriental Society, Vol. XXI.



as having led them into the countries they now occupy from Makrán, and as having founded a kingdom with its capital at Seví (Síbí). The third relates the romantic story of Dostem, a young Balochi warrior, and his bride Shíren.

This paper will be published in the Journal, Part I.

5. *Remarks on a Pálí Inscription from Bhárhāt.*—By RÁJENDRALÁLA MITRA, LL. D., C. I. E.

Some time ago I translated for General Cunningham a Pálí Inscription in the Lát character found on the Eastern gateway of the Bhárhāt Stúpa. I had then before me a reduced eye-copy, and was doubtful about some of the letters. The last word of the record puzzled me most, and I suggested a reading different from what the letters before me would warrant. The gateway has since been removed to the Indian Museum, and I have had several opportunities of studying the record as inscribed on the stone. The result of this study I now desire to lay before the Society.

The record occurs on the left pillar of the gateway. The pillar is a compound one, made up of four shafts each having eight facets. The record is inscribed on two facets of the front and on three facets of the hind shaft. It is in a perfect state of preservation, and comprises four lines of matter arranged in five columns, the second and the third line extending to the fourth column and the fourth to the third. The words are :—

	1	2	3	4	5
Line 1	सुगणं Suganam	राजे raje	राज्ञ rajña	गामीपुतस Gágíputasa	विसदेवस Visadevasa
	1	2	3	4	
„ 2	पौतेण pautēṇa	गोतीपुतस Gotiputasa	अगराजुस Agarájusa	पुतेण putēṇa	
	1	2	3	4	
„ 3	वाङ्गीपुतेण Váchhiputeṇa	धनभतिष्ठा Dhanabhutiná	कारितं káritam	तोरणं toranam	
	1	2	3		
„ 4	सिलकम्मतो silákammato	च cha	उपणं. upaṇṇa.		

The first word of the first line is obviously the Pálí form of the Sanskrit *Srughna*, the name of a country ; but the case-affix attached to it is incorrect. In Sanskrit and in Pálí the word is masculine, and in the nominative case in Pálí it should have no nasal mark after it. Assuming that in Pálí it was used in the neuter gender, still, the nasal mark for the neuter nominative should not be used, for the sentence has a different nominative. The word should be in the locative, *sugane* 'in Sugana.' If it be assumed

that it has been compounded with the second word *raje* which is in the locative, the dot for the case-mark would not be wanted. It is, therefore, obviously wrong, and is due either to the engraver having mistaken the mark of the locative *e*, or it is a blot. The second word, *raje* for *rájye*, being in the locative, cannot qualify the nominative. The meaning of the two words is: "in the kingdom of Sugana." The third word, *rajña* for *rájña*, is in the genitive, and qualifies the fifth word *Visadeva*, which is also in the genitive case. The fourth word is also an epithet qualifying *Visadeva*. It means "son of Gágí." The first word of the second line is in the instrumental case, and qualifies the causal nominative *Dhanabhutíná* of the 3rd line. It means "by the grandson." The second word is clear enough; it means "son of Goti," and is an epithet qualifying the third word *Agarájusa*, a proper name in the genitive, governing the last word *putena*, which is an epithet of the 2nd word of the third line. The first word of the 3rd line is also an epithet of the same kind. It means "by the son of Váchhi." The second word is the causal nominative of the sentence, and agrees with the causal participle which follows it, and which governs the objective case represented by the last word. The dots after the 3rd and the 4th words are very faint and appear to have been produced by abrasion of the stone, but they are wanted.

In so far the grammatical construction of the sentence and its meaning are perfectly clear; but the last line is very puzzling. Its first word is a compound of *Silá* "a stone" and *Kamma* "work," "fabrication," i. e., sculpture. The long vowel at the end of *Silá*, is so distinct that I cannot take the word for *Sila*, "good conduct." It is true that in the Laṭ Pálí writings the vowel-marks are frequently neglected; but the neglect is always shown by omission of vowel-marks, as in *raje* for *rájye*, and not by the insertion of marks where none is wanted; at least, I have nowhere seen an instance of the kind. The word *silá*, moreover, never takes the long vowel at the end, and, with it, it cannot mean good conduct, or moral merit. The meaning, therefore, must be 'stone carvings,' and this corresponds very well with the subject of the record. In the eye-copy I read the affix at the end of the compound *tá*. This is an affix commonly employed for the formation of abstract nouns, and is not wanted here, but it is often used as an expletive, as in *Devatá*, and does not disturb the sense,—at least I had no hesitation in accepting it as such. The second word *cha* is a conjunction, equivalent to the English *and*, and its effect is to bring forward the causal nominative *Dhanabhuti*, who not only caused the toraṇa to be erected, but also added to it sculptured decorations. It can also bring forward the causal verb *káritam*, but if a new verb be supplied it may be let alone. The most puzzling word in the record is *upanna*. When I first read it in the eye-copy I believed the dot over the *p* to be a mistake, and the word was

upāna, 'a plinth.' The dot, however, is perfectly clear and unmistakable, and cannot be rejected without assuming an error on the part of the engraver. If no such error be admitted, the word would be an incorrect form of the Sanskrit utpanna = Pāli uppanna, "produced." The inaccuracy I allude to results from the omission of one of the p's, but in the old Laṭ character double letters were frequently, if not invariably, simplified, and this I thought was an instance. I felt too that utpanna, as a neuter participle, could not agree with the causal nominative Dhanabhutinā. The writer of the record had correctly used the causal form in *kāritam* and could not be accused of having been ignorant of the causal form of *utpanna*, which is *utpādita*. It could not be made to correspond with the first word of the line *silākammata*, for that would be opposed both to grammar and sense. The use of the conjunction *cha* in prose brings forward the nominative Dhanabhuti, and this has to be rejected, and the conjunction declared to have been wrongly put. It had to be, moreover, assumed that the donor did not care to associate his name with the sculptures. In short, I had to accept either an error on the part of the engraver for having accidentally put a dot over a letter where none should exist, or ignorance of grammar on the part of the writer for not knowing the causal form of *utpanna*, and for putting a conjunction where none was wanted. I had no hesitation, therefore, in accepting the first branch of the alternative. An error on the part of an engraver was much more likely than ignorance of elementary rules of grammar on the part of a writer employed by an unquestionably rich man, probably a king. Moreover, a mistake of the kind was very liable to occur; the long vowel after p, in upāna is indicated by a very short dash on top, and it may be confounded for a dot.

My revision of upāna, however, I now find, cannot be accepted, as the only fragment of the plinth of the tope seen by General Cunningham, is made of mortar and plaster, and not of sculptured stone, and the railing and the gateway have no plinths. The apparent reading upanna must therefore be accepted, deriving it from the Sanskrit *utpanna* "produced, born, arose;" or from *upapanna* "endowed or embellished," or from *upagṇa* "that which is supported." The second appears to me to be the most appropriate, though the derivation is not quite satisfactory.

The correct reading of the first word of the last line I find is not *silākammata* but *silākammato* for the Sanskrit *silākarmatas*, used in an instrumental sense. Added to the last word it gives the meaning "embellished with stone carvings," a very appropriate epithet for the toraṇa; the *cha* being reckoned a mere expletive.

Putting the results of these remarks together I make out the following meaning of the inscription:—

"In the kingdom of Sugana, (this) toraṇa embellished with stone carv-

is was caused to be erected by Dhanabbuti, son of Váchhí and of aráju, the son of Gotí, and grandson of king Visadeva, son of Gágí."

It will be seen that in this the donor assumes no regal title, nor does assign any to his father. The word *rāju* is the second member of a npound word, and the two words together make up the personal name. e omission of all titles in the case of the donor may be due to a sense of mility, or to a desire to avoid the display of worldly greatness in a quasi igious monument, but this cannot be predicated of the father, who had bably then demised, as in the case of the grandfather the title has been refully put in.

It is observable also that the grandfather traces his descent from his other Gágí, and does not name his father. To Indians of the present day thing would appear more shocking than this. An adage is current ong them to the effect that "a man who is known by his own name is the blest, he who appeals to his father's name to make himself known, is of ddling merit; but he, who has to appeal to his mother's name for the rpose, is vile, and he, who makes himself known by the name of s wife, is the vilest of the vile."\* The feeling is so strong in this spect that no gentleman will ever pronounce his mother's name, except en performing a religious rite, or in a legal document. In Bengal the ual plan to indicate a lady who happens to be the wife of the master of e house is to call her *ginní*, "the mistress of the house." Should she ppen to have rivals, the fact is indicated by the use of the terms *Baḍa*, *ēja* &c., 'the eldest,' the 'second' and so on, but on no account is the me of any one recited. The same is the case with daughters-in-law, who e described as *Baḍabahu*, *Mejabahu*, and so on. Sometimes when greater ecision is wanted the family name of the father of a lady is used thus, *'itrer báḍir jhí*, "daughter of the house of the Mitras." In the North- estern Provinces, both among Hindus and Mubammadans, the same stom is followed, and the ladies are ordinarily indicated by periphrasis. his was, however, not the custom in former days; and not only the names ladies of rank were freely used, but metronymics were formed extensively indicate their children. To judge from the instances so abundant in the ámáyaṇa and the Mahábhárata the use of metronymics was ordinarily stricted to children born out of wedlock, or what would be the same ing, deserted by their fathers; but unforsaken legitimate children were metimes so named. Long before the time of the Rámáyaṇa, Páṇini rmulated a great number of rules for the formation of metronymics.

From the examples accessible to me it appears that generally the per-

\* सनामा पुत्रोधन्यः पिहनामा च मध्यमः ।

अधमः साहनामा च पत्नीनामाधमाधमः ॥

sonal names of the mothers were used for the formation of metronymics, but the names of their race or country were not invariably rejected. Of the former class the instances at command are abundant. Thus Bhīshma, the great sage and general of the Kuru race, was called Gāṅgeya, because he was born out of wedlock of the River Ganges in a personified form. Hanumān, the monkey general of Rāma, is called Ānjaneya, because he was born of the storm-god Pavana by Anjanā, wife of Keśarī. Vyāsa, the compiler of the Vedas, is called Satyavatīsuta, 'the son of Satyavatī,' a fisherwoman whom Parāsara seduced. The Pāṇḍava brothers Yudhiṣṭhira, Bhīma, and Arjuna, whose births are euphemistically attributed to Dharma, Indra, and Vāyu, are frequently addressed by their metronymic Kaunteyāh, the "sons of Kuntī." One name of Kuntī was Prithā, and Arjuna called himself Pārtha in honour of her. Dhritarāshṭra born of Ambikā, wife of Vichitravīrya by Vyāsa, is called Ambikāsuta. Karṇa, another half-brother of the Pāṇḍus, was born of Kuntī before her marriage, and, having been brought up by one Rādhā, bore the metronymic of Rādheya. In the Chhāndogya Upanishad there is a remarkable instance of this kind. A boy, about to go to a tutor, asks his mother what was his family gotra, and she replies: "I know not, child, of what gotra you are. During my youth when I got thee, I was engaged to serve many as a maid-servant; I know not of what gotra you are; Jābālā is my name, and Satyakāma thine; say therefore, when asked, that you are Satyakāma Jābāla (son of Jābālā)." The youth was accepted as a Brāhmaṇ for his boldness in telling the truth to his tutor, and subsequently he attained great distinction as an expounder of theology. The atheist Jābāla, who figures so prominently in the Rāmāyaṇa, was a descendant of this youth. Of deserted sons taking the metronymic we have an instance in the Aitareya Brāhmaṇa. The first mother of the Aitareyins was Itarā. Her husband deserted her and her infant son, and therefore the latter took the name of his mother, and called himself Aitareya. Lakshmaṇa, forsaken by his father, bore the metronymic of Saumitra, son of Sumitrā.

Of race names the only instance I can call to mind just now is Gautamī, the foster-mother and aunt of Buddha. Of names of females formed by those of their native countries we have Mādri, named after the country Madra where she was born, and her sons born out of wedlock are called Mādreya: Gāndhārī, wife of Dhritarāshṭra, owes her name to her father's country Gāndhāra, modern Kandhār; Baladeva, transferred from the womb of Devakī to that of Rohiṇī to save him from being destroyed by the Indian Herod Kaṇśa, bears the name of Rauhiṇeya. Other instances of this kind may be multiplied *ad libitum*; but I suppose they are not wanted. Those I have cited will suffice to show that metronymics were formerly largely used, and that in most instances they implied some flaw in the birth,

or some difference with the male parent. Nor was the circumstance of one's being born out of wedlock, however unpleasant it may be to be told so, held a bar to distinction in learning or social rank in ancient times. Not to advert to modern Dukes, Marquisses, Lords, Baronets, Rájás, Navábs, and others, the bar sinister on whose escutcheons has not in the least interfered with their rising in social rank in our times, the renown of Vyása, Jábála and the Páñḍus suffices to show that none need doubt the fact of metronymics having been derived from the personal names of mothers, and of Indian people having used them without scruple.

The three female names given in the inscription, Gágí, Gotí and Váchhí, in their Sanskrit forms would be Gárgeyí or Gárgyí, Gautamí, and Vátsí, and these are largely used in race or Gotra names ; but there is no reason to suppose that they have been used in the inscription to indicate gotras. According to Hindu law no male person can inherit the gotra of his mother, or wife. On the contrary every woman ceases to be of the gotra of her father the moment she is married, and the marriage rite includes a ritual for effecting this change. No Hindu, therefore, can be expected to appeal to the gotra of his mother's father. Personal names may be formed of gotra names ; but when so formed they are strictly proper names, indicating particular individuals, and not races or tribes. Moreover, a patronymic or a metronymic formed by an affix may indicate an immediate descendant, or one, two or more generations removed ; and when great precision is sought, it is usual to avoid affixes, and to compound the name with the word putra, "son," whereby the name becomes at once specific, and the nearest relationship is implied. In the inscription this specific form, Gágíputra, is used, and therefore no legitimate doubt can be entertained of the names having been intended for particular individuals.

6. *A List of the Earthquakes recorded in Assam during the year 1879. Communicated by the Meteorological Reporter to the Government of Bengal.*

This will be published in the Journal Part II.

The following communication has been received.

*Note on some copper Buddhist Coins.*—By H. RIVETT-CARNAC, C. S.,  
C. I. E.

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## LIBRARY.

The following additions have been made to the Library since the Meeting held in February last.

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presented by the respective Societies and Editors.

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*Hennessey, J. B. N.*—Further particulars of the Transit of Venus across the Sun, December 9, 1874; observed on the Himalaya Mountains, Mussoorie, at Mary-Villa Station, Lat. 30° 28' N., Long. 78° 3' E., height above the sea 6,765 feet, with the Royal Society's 5-inch Equatorial. Note III. *Stewart, Balfour* and *Dodgson, W.*—Preliminary Report to the Committee on Solar Physics on the evidence in favour of the Existence of certain Short Periods common to Solar and Terrestrial Phenomena. *Hannay, J. B.* and *Hogarth, J.*—On the Solubility of Solids in Gases. *Galton, F.*—The Geometric Mean in Vital and Social Statistics. *McAlister, D.*—The Law of the Geometric Mean.

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*Mance, H. C.*—Remarkable Phosphorescence in the Persian Gulf. *Ayrton,*

W. E.—Note on Mr. Manco's letter on "Remarkable Phosphorescence in the Persian Gulf,"

Munich. Repertorium für Experimental-Physik,—Vol. XVI, No. 1.

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Schaffhausen. Schweizerische entomologische Gesellschaft,—Mittheilungen, Vol. V, No. 9.

Schindler, Dr. E.—Die Larve des *Scymnus analis* Fb. ein Wachsproducent.

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Vienna. Anthropologische Gesellschaft,—Mittheilungen, Vol. IX, Nos. 7—8.

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Nehring, Dr. A.—Fossilreste Kleiner Säugethiere aus dem Diluvium von Nussdorf bei Wien.

———. Verhandlungen, Nos. 10—13.

### BOOKS AND PAMPHLETS,

*presented by the Authors, Editors and Translators.*

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FOUCAUX, PH. ED. Vikramorvaçi ; ourvaçi donnée pour prix de l'heroïsme : drame en cinq actes de Kalidasa. Traduit du Sanscrit. 12mo., Paris, 1879.

HODGSON, B. H. Essays on the Languages, Literature and Religion of Népál and Tibet. 8vo., London, 1874.

WOOD-MASON, J. Morphological notes bearing on the Origin of Insects. 8vo., London, 1879. Pamphlet.

### MISCELLANEOUS PRESENTATIONS.

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SMITH, F. Descriptions of New Species of Hymenoptera in the Collection of the British Museum. 8vo., London, 1879.

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Report on the Administration of the Land Revenue Department of the Central Provinces, for the Revenue Year 1878-79. Fcp., Nagpur, 1879.

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AA., P. J. B. C. ROBIDE' VAN DER. Reizen naar Nederlandsch Nieuw Guinea in de Jaren 1871, 1872, 1875-76. 8vo., The Hague, 1879.

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NEUMAYR, DR. M. Zur Kenntniss der Fauna des untersten Lias in den Nordalpen. 4to., Vienna, 1879.

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Report on the Administration of the Madras Presidency during the year 1878-79. 8vo., Madras, 1879.

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 D. D.—On Certain Effects of Starvation on Vegetable and Animal Tissues.  
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- . The Publishers' Circular,—Vol. XLIII, Nos. 1016 and 1017.
- . The Quarterly Review,—Vol. CXLIX, No. 297, January 1880.
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- . Journal des Savants,—January 1880.
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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL,  
FOR APRIL, 1880.

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The monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 7th April, at 9. 15 P. M.

H. B. MEDLICOTT, Esq., F. R. S., President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Surveyor General of India,—Account of the operations of the Great Trigonometrical Survey of India. Vol. V. Details of the Pendulum observations and of their Reduction. By Captain J. P. Basevi, and Captain H. J. Heaviside.

2. From Dr. R. Mitra,—Facsimiles of Inscriptions from the Great Temple of Puri.

3. From Dr. G. Leitner,—Proceedings of the Anjuman-i-Panjab in connexion with the proposed Bill for the appointment of persons to the office of Kazi.

4. From the Home, Revenue and Agricultural Department,—(1) Yajurveda Sanhita. (2) Scientific Results of the Second Yarkand Mission: Rhynchota. By W. L. Distant.

5. From the Superintendent, Marine Survey Department,—Charts of (1) Jaygad and Entrance to Shástri River, (2) Chaul and Entrance to Kundalika River, (3) Quilon Roads, and (4) Mullaitivu.

6. From the authors,—(1) Erläuternde Angaben über den IV Band der "Reisen in Indien und Hochasien" nebst Bericht über die landschaftlichen Aufnahmen und die Tafeln. By H. von Schlagintweit-Sakünlünski. (2) Account of the Incarnation of Govardhananatha. By Mohun Lall Vishnu Lall. (3) The Tougoo God-language conspiracy. By Mrs. Eleanor Mason.

The following gentlemen, duly proposed and seconded at the last Meeting, were balloted for and elected Ordinary Members—

W. Fiddian, Esq.

N. Elias, Esq.

Babu Bipina Chunder Rai.

Ananda Rāma Gajapati, the Raja of Vizianagram.

The following are candidates for ballot at the next meeting—

1. R. H. McLeod, Esq., C. S., Assistant Magistrate, Benares, proposed by H. Rivett-Carnac, Esq., seconded by P. C. Wheeler, Esq., C. S.

2. Rao Sahib Visvanath Narayana Mandalik, C. S. I., Bombay, proposed by Dr. R. Mitra, seconded by J. Crawford, Esq.

3. Babu Tara Prasad Chatterjea, proposed by Moulvie Abdul Latif Khan, Bahadoor, seconded by J. Crawford, Esq.

The SECRETARY reported that the Hon. C. D. Field, and Dr. V. Richards had intimated their desire to withdraw from the Society.

The SECRETARY submitted the following Estimate of Income and Expenditure for the year 1880.

#### INCOME.

Balance in hand.....	Rs.	3,617	5	4
Subscriptions.....		7,000	0	0
Sale of Publications.....		1,600	0	0
Interest on Vested Funds.....		6,131	0	0
		18,348	5	4

#### EXPENDITURE.

Publications.....	Rs.	7,000	0	0
Library.....		3,000	0	0
Book-Cases for Library.....		1,000	0	0
Establishment.....		4,200	0	0
Contingencies.....		1,200	0	0
Building and Furniture. ...		600	0	0
Coins.....		200	0	0
Taxes.....		852	0	0
		18,052	0	0

The SECRETARY exhibited a metal celt forwarded for the inspection of the Society by Mr. H. Rivett-Carnac, and read a Memorandum by him on the same.

Mr. Rivett-Carnac says :

I submit herewith for the inspection of the Society what appears to be a metal Celt of the type well known in many collections in Europe.

The implement which was in all probability used as an axe-head or hatchet, is 5½ inches long by 4 inches broad. The metal is apparently bronze, being too hard and heavy for copper.

It was found in the Hurdul District, Oudh, by Colonel Montague Procter who has been good enough to place it at my disposal.

A reference to the sketch which accompanies my paper on Prehistoric Remains in the Central Provinces will shew a similar implement of iron, with the bands by which the axe head was fastened to the shaft.

Dr. HOERNLE exhibited a number of Buddhist copper coins, and read a note on the same by H. Rivett-Carnac, Esq., C. S., C. I. E., F. S. A. They form a collection of 22 small coins, all belonging to Mr. Rivett-Carnac, and kindly sent by him for the inspection of the Society. Most of the coins are round ; but a few are square. The obverse generally shows some animal (bull, elephant, or lion) ; the name of the king being inscribed above or below the figure. The reverse generally shows some Buddhist symbols. The names are not very distinct ; but such as they are, they have been read by Mr. A. Carlleyle, as follow : *Vaisákha Deva* (2 square coins), *Kamuda Sena*, *Aja Varmma* or *Asha Varmma*, *Maphaba Varma*, *Maha Satama*, *Satya Mitra*, *Ayu Mitra*, *Suya Mitra*, *Jaya Mitra*, *Vijaya Mitra*, *Laranga* or *Larata* or *Lájasa*, *Súgáta Janapya*.

Mr. Rivett-Carnac's note with a Plate of the coins will be published in Part I of the Journal.

Dr. HOERNLE also exhibited 28 small copper coins of the Sunga Dynasty, and read a Memorandum on them by H. Rivett-Carnac, Esq., C. S., C. I. E., F. S. A. These coins also belong to Mr. Rivett-Carnac, they are mostly of the same type as those which were noticed in the Proceedings for January. The memorandum is principally occupied with a description of the monograms or devices of the different kings, exhibited on the reverses of the coins. On most coins the device is a standing figure on a platform, between two staffs surmounted by three cross-bars ; the head surrounded by rays or flames. On others, however, the platform and the side-poles are wanting ; on others again the figure is female.

Dr. Hoernle remarked that great credit was due to Mr. Rivett-Carnac for his success in collecting so many new or as yet little known coins. As to the device on the reverse of some of the Buddhist coins, which Mr. Rivett-Carnac supposed to represent the *triśúla*, it really was the Buddhist symbol *triratna* or "three jewels," on the two sides of which there seemed to be represented bodhi-trees. On two coins he could distinguish the figure of an elephant ; on two others there was the cross-like symbol,

*svastika*. What Mr. Rivett-Carnac had supposed to be a pair of fishes, might possibly be a conventional mode of figuring the sacred *Buddhapada* or foot-prints of Buddha.

Mr. Rivett-Carnac's Memorandum will be published in Part I of the Journal.

The following papers were read—

1. *Note on an Inscription on an ancient Mosque in Koh Indm, Zillah Allahabad, sent by A. M. MARKHAM, Esq., C. S.—By MAJOR H. S. JARRETT.*

An inscription on ruined Mosque in Koh Inám, Pergunnah Kara, Zillah Allahábád, (a large village razed to the ground for rebellion in 1858,) sent by A. M. Markham, Esq., C. S., was shown by Dr. Hoernle who read the following note of Major H. S. Jarrett on it :

The inscription is as follows :

نپاشد مسجد جامع منور	بعد شاه عادل هفت کشور
شاه فیروز شاهشاه غازی	بفرمانش بناء خیر قاضی
حسام الدین حسن مدر نه مانه	که فضلش گشت در عالم نشانه
بسایه ماه رمضان گشت موجود	ز هجرت هفصد و هشتاد و شش بود

۷۸۶

(This) Glorious Jami Masjid was built  
In the reign of the just king of the Seven Regions of the World.  
King Firúz king of kings the Champion ;  
By his command, the auspicious foundation of the Kázi.  
Husámu'ddín Hasan, chief of the age\*  
Whose eminence is a beacon in the world,  
Was completed on the last day of Ramadán†  
It was in the year 786 of the Hijrah.

This was in the reign of Firúz Shah of the House of Tuglak.

I find a mention in the Tarikh i Firúz Sháhi (of Zia'uddín Bami) of a *Husámu'ddín Hasan* who was Finance Minister or Examiner of Accounts in the reign of Ghiasuddín Tughlak Sháh who assumed the crown in 721 A. H. (1321 A. D.) The Chief Kádhi during his reign and that of his son Muḥammad was Kamálu'ddin.

The Chief Kazi (Sadr Jahán or Sadr Zemána) in that of Firúz Shah, was Jalálu'ddin Kirmíni. There is no mention of a Husámu'ddin in his

\* A title given to the Kádhiu'l Kuzzát or Chief Kázi.

† Monday, 15th November 1384.

reign—yet the inscription describes this person as a Kázi and the title Sadr Zemána confirms it. Probably one of the name succeeded Jalalu'ddin on that Kazi's death but there is no trace of this to be found in the works I have consulted.

2. *The use of Silver Films in Improved Instruments of the Camera Lucida class.*—By J. C. DOUGLAS, Esq.

These instruments are divisible into two classes, *viz.*, that in which a reflected image of the object is seen while the tracing point is seen direct, and the other class in which the object or tracing point is seen by reflection, but the tracing point or object is seen by light transmitted through a plate which acts at the same time as a reflector. The forms in most common use are the camera lucida, and the steel disc or Soemmering's mirror of the first class; and the parallel plate or tinted glass reflector of the second class. There are other forms less common but each referable to one of the two classes described above. Instruments of the first class give a brilliant and well defined reflected image; but they are fatiguing to use, and some persons experience great difficulty in using them. Instruments on the other principle are far more easily used, they cause less fatigue, but the reflected image is not so brilliant. In the case of the plane glass reflector the definition cannot be so good, as both surfaces of the glass reflect and there are therefore two superimposed images which do not exactly coincide; the second reflection is, however, weakened by using tinted glass, and this colouring also serves to reduce the transmitted light which would otherwise flood out the weak reflected image.

What is required in an instrument of this kind is the brilliancy and clear definition of the camera lucida, combined with the simplicity and ease in use, and the cheapness, of the tinted plane glass reflector; with the facility when desired, for using two reflections in order that the reflected image may not be reversed. I believe these requirements are attainable by the use of silver films on glass.

Silver films are so highly reflective that two or more successive reflections may be used if desired; by transmitted light the colour of the film is suitable for tinting the glass. The thickness of the film may be regulated according to requirements, a thick film being used when reflection only is required, and a thinner one according to the ratio desired between the reflected and transmitted light. The reflective power of the thinnest film is greatly superior to that of glass. The silver film is applicable to most forms in use, and it may be used not only on plane but on curved surfaces, *e. g.*, a plano concave lens silvered on the plane side might be used by a short-sighted person instead of the common plane reflector used in sketching microscopic objects, a slight curvature of the 1st or 2nd reflecting sur-



face in the camera lucida might be used to render it unnecessary to employ a lens to equalize the sensibly different distances of the images of the object and plane of delineation. The cost of silver films on glass is very trifling, and if taken care of they last for years; a number might be made at intervals, or they might be supplied for a trifling sum by the opticians.

For many purposes the films might be deposited on thin glass and varnished or protected by glass, when they would be very durable and would bear handling. For some purposes the film might be thickened by electro deposition and removed from the glass. As the films are so cheap, a number of graduated thickness might be kept, and a suitable one selected in each case to adjust the relative brilliancies of the reflected and transmitted light; or the films might be applied as the dark glasses usually supplied with the camera lucida, but this seems less simple and convenient than the use of a thicker or thinner film as transmitting reflector. A silver surface may reflect upwards of 90% of the incident light, a total reflecting prism has been found to reflect only about 75% or less, the loss being due to reflection at the first surface and absorption; the superiority of the silver surface is evident, particularly when several successive reflections are required. Even if the highest attainable brilliancy be not generally required, still the higher this is, the greater the range of adjustment without alteration of the source of light. The strictest regularity in the film not being essential, suitable films are very readily obtained. With strict cleanliness, pure chemicals, care that the glass is wetted equally in every part by water or alcohol at the moment of immersion in the silvering solution, and care that the solution is properly mixed, *i. e.*, homogeneous, success is readily attained.

I find\* that 'Professor Govi of Rome has devised' a form of camera lucida in which a metallic film is used. He simply gilds the reflecting surface of the camera lucida prism with a thin film of gold, and cements to this surface with canada balsam another similar prism; M. Nachet has adopted this improvement in the construction of various forms of camera lucida. The greater advantage of the silver film are obvious. By the use of silvered glass, instruments of various forms and of large size may be readily constructed for a trifling sum by any ingenious person; thus an instrument may be devised and readily constructed for any special purpose. The following is a description of the instruments exhibited at the meeting:

1. An ordinary tinted glass reflector for use with the microscope. The tinted glass usually used was replaced by a piece of glass covered with a thin film of silver. The silvered side is turned towards the eye-piece and

\* Annual Record of Science and Industry, 1875, p. 144.



Fig. 1.

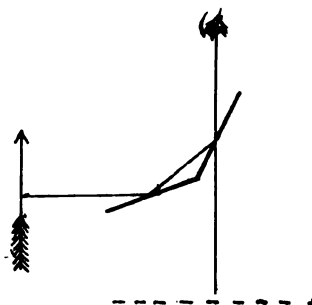


Fig. 2.

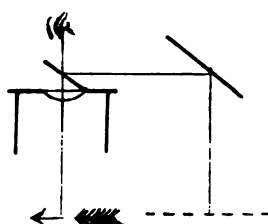
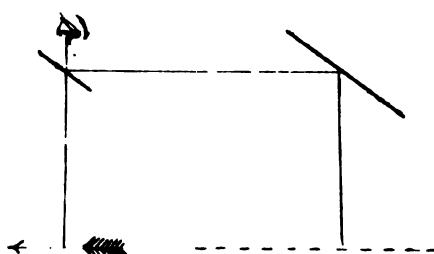


Fig. 3.



Zinc-graphed at the Surveyor General's Office, Calcutta

On the use of Silver Films in improved instruments  
of the Camera Lucida Class by J. C. Douglas.

reflects the magnified image. In this form several reflectors differing in the thickness of the silver film should be available for regulating the ratio between the transmitted and reflected light, but a certain thickness of film will be found which is applicable to most purposes so that change of reflector is seldom necessary.

2. Camera lucida with double reflection, Plate I, figure 1. The first reflection is from a thick film of silver, the second is from a thinner film. The thickness of the second film may be adjusted as described above. It will be seen that the plane of delineation is seen *through* the second reflector, not past it as in the ordinary instrument. In the diagrams the thick oblique lines are the silver films, the thin lines the directions of the light, the arrows the objects and the dotted line the paper on which the objects are to be drawn.

3. A form of reflecting camera for sketching microscopic objects, Plate I, figure 2. This instrument being fitted to the eye-piece of the microscope, the paper and pencil point under the larger reflector appear in the field of the microscope. The object is seen direct. The second mirror in the instrument exhibited was an inch square. This instrument may be used with the body of the microscope at any angle, it being merely necessary to place the drawing paper in a plane parallel with that of the microscope stage. In the figures 2 and 3 the mirrors are represented as parallel, they should usually be slightly inclined to each other to increase distance between plane of delineation and the object.

4. Another reflecting camera for sketching small objects is represented in Plate I, figure 3. In the instrument exhibited the larger reflector was  $1\frac{1}{2}'' \times 1\frac{1}{2}''$  and placed 10'' from the paper, the field was about  $4\frac{1}{2}$  inches square. This instrument may be used horizontal or inclined, and it is admirably adapted for drawing such objects as insects, leaves, shells, &c. If the vertical distances between the mirrors and the object and paper respectively be constant in instruments of this form, the relative magnitudes of object and drawing will obviously vary with the distance between the reflectors. It is evident that by the use of reflectors in instruments of this class, the reflecting surfaces may be larger and the distance between them greater than if a prism were used.

The above are only examples of the application of silver films to a particular class of instrument, it is evident they offer great facility for giving this class of instrument its maximum development. It is obvious also that silver films are applicable with advantage in many other cases where prisms are used at present, particularly where it is desired to divide a beam of light into two; *e. g.*, if figure 3 be turned upside down, and the two eyes of the observer be in the place of the arrow and the dotted line, the diagram represents an arrangement suitable for a

non-stereoscopic binocular microscope, the inclination between the mirrors being varied to suit the distance between the eyes; the loss of light in such an arrangement would be very little, and the brilliancy of the two images might be rendered very nearly equal.

To illustrate how cheaply such instruments may be made the mirrors in the instruments exhibited were mounted in tubes of thin sheet zinc which is readily cut with ordinary scissors and bent into shape with pliers; a coat of asphalt varnish used for making shallow cells was applied for the sake of appearance. The instrument, figure 2, was fastened to the eye-piece by a piece of zinc bent half round the eye-piece tube and held against it by a small elastic rubber band. The tinted reflector was supported by a bent plate of zinc hung on the milled edge of the eye-piece by a groove passing almost half round the eye-piece; this is a most convenient method of attaching the reflector or camera to the eye-piece, as it is quite firm enough and yet removable in an instant without disturbing the microscope.

8. *Transcripts and Translations of two Inscriptions from Buddha-Gayá.*—  
By DR. RÁJENDRALÁLA MITRA, C. I. E.

Dr Mitra stated that during his last stay at Buddha-Gayá he tried much to obtain copies of all the inscriptions that could be had there, but, owing to various causes, a few escaped him. Two of these had been lately placed at his disposal by General Cunningham. They were not of any very early age, nor connected with the history of the great temple at the place; but both of them were dated, and of interest. The larger of the two records measures 19 × 12 inches, and comprises 17 lines of writing, parts of which have been obliterated. The small one is limited to 7 × 6 inches, and contains 8 lines of Sanskrit. The character used is in both the same, the Kuṭila, but of different periods.

The language of the large record is high-flown, and very much involved. Metaphors and similes are scattered in it with no niggard hand, and they are mostly very much over-strained, and difficult of reproduction in plain English.

The purport of the monument is the commemoration of the excavation of a cave (Guhá), the dedication of the images of the "three jewels" of Buddhism, and the performance of a sacrifice in a courtyard. The epithets used to describe the three jewels are, as far as the words are concerned, easy enough, but it is difficult to make out their bearings. The word used for the sacrifice is *Satra*, which is a Vedic rite, which no Buddhist would celebrate. Probably the word has been used in a restricted sense to imply some Buddhist ceremonial the nature of which is not known. The courtyard is not properly defined; it may mean the area before the cave, or that in front of the Great Temple before the Bodhi tree—probably the former.

The author of the pious deeds was a hermit of the name Jayachchana, who was the spiritual guide of the king of Kási, and a disciple of a saint named Śrimitra, whose eulogy fills more than one half of the record. All the pious deeds were performed on the same day, i. e., on Saturday, the 5th of the wane, in the month of Jyāishṭha, in the year of Vikramānka 4? The date is given in words of which the fourth has been obliterated. The first three are clear enough, and the fourth must have been a word of 10 syllables implying a figure from 1 to 9. This carries the record to the last decade of the 12th century. A Kāyastha, of the name of Manoratha, composed the record; one Purandara transcribed it, and Dhārādhara engraved it.

The second record was inscribed on the 18th year of the reign of Narmapāla, who was the 2nd of the Pāla dynasty of Bengal. According to Dr. Mitra's calculation he must have begun his reign on or about 875, and the record must, therefore, belong to the last decade of the 9th century. It commemorates the consecration of a four-faced Mahādeva, and the excavation of a tank by one Saka, son of a sculptor, at a cost of three thousand *ummas*.

The two records are separated by an interval of about three centuries, and the earlier of them shows that Hinduism was flourishing at the time of Buddha Gayá, and the later one proves that Buddhism had not lost all influence there at the close of the 12th century, and that the excavation of Buddhist caves had not ceased, as supposed by some, between 650 and 675 A.D., the uncertainty, instead of ranging within the narrow range of 25 years, extending to over five centuries. It, likewise, shows that in that century the current coin of the place was called *drumma*, the Sanskrit form of the Greek *Drachma*. Mention of this money has been met with in other records. The *drumma* appears to be a sequel to the currency of the *ar* mentioned in an inscription on the Sānchi gateway.

*Transcript in Devanāgarī of Inscription No. 1.*

- । ॐ नमो बुद्धाय ॥ उद्धूतः करभावः प्रविकचरच्चिरश्रीविशालहिमालीबालेन्द्र-  
दुश्चदुतिविततिपदेनोदयस्तिः समन्तात् । अन्तस्सुदृढशुद्धप्रव-  
। रमुदगुष्पामधमप्ररोहैः संबद्धो भूतिहेतुलज्जगद्गदयमस्तुशालः प्रिये वः ॥ ( १ )  
यस्यान्तःसुदृढलोकलोकलोकलोकलोकलोकलोकलोकलोकलोकलोकलोकलोकलोकलोकलोक-  
। विवृत्तिरैरिव शरच्चन्द्रप्रभस्य प्रभोः । भाति प्रसूतपाटलासल्लनसन्नेष्टिर्विविधप्रभना  
रागः कोपि कृपात्मको दिशतु वः श्रेयस्तुलोकेश-  
। वः ॥ ( २ ) अथास्मिन्मत्तसंज्ञेसंज्ञविषयस्यासक्तमेवीमयस्यार्त्तोत्कर्षविशेषकस्मिन्मिति-  
ष्ठातिःपताकामिव । विषयापिष्टपाष्टपाष्टममितः  
। श्रीनिर्मितं विभक्तोद्देशादेकजटापटूक्तजगद्गुष्पामधमप्रभुमिति ॥ ( ३ ) अस्ति विज्ञो-  
कीयुक्तप्रकृतः सचेतनामत्तितसंज्ञेभूतः । सम्बद्धसिद्धान्तप्रयी-

- ६। रभूतः श्रीमित्रनामा परमोत्तमः ॥ (४) हिंसाहिंसामशेषाः श्रद्धासिद्धिदण्ड-  
वस्त्रासमाश्रित्य धर्मो + श्रद्धाः प्रत्यक्षपरतया विश्वविद्यासम्-  
७। मेः । चेतःसंप्रियमाणा मधुरतरुद्वयोः श्लेषयूषपातिलिख्यं हः स्र (सु) कवन्ति चतुस्र-  
पटलं यस्या मैत्रीषु विवस्म ॥ (५) सिद्धोरुद्विष्टदृष्टपटलावहना-  
८। मभ्युत्थताः स्वेनोपेत्य पतिं रता गुणगणव्यासङ्गिनी रङ्गिनीः । यथाद्वैतमया मनामिष  
द्वयः प्रान्तेन पादात्मना जीवन्मुक्तिवधूविद्या-  
९। सरसिकः सावर्ज्यमाश्लोकते ॥ (६) वीतस्युहोपि हृदया अमदुहिधीर्षुः सम्बुद्धत्वपरम-  
परमोद्दृष्ट्या । इत्यपीतनीपरनिष्ठमतीन् विनीय यः श्रीष-  
१०। मार्शनचक्षानचिरेत् चक्षे ॥ (७) स्रष्टं न यद्यश्चकचेतसापि नित्यकद्व्याश्र  
दिभ्यस्तद्वत् । चित्तामणिचिन्तितदानचन्द्रो यस्मिन्नावप चपयेव च या-  
११। म् ॥ (८) स्थायं स्थायमशेषनिर्जरसरित्क्षोतः स्रष्टव्यमनः सम्बुद्धत्वपदस्युहोपि  
वज्रमः श्रीद्विभाजीश्वरम् । शेषेषापि तुलामुपेत्य कतिनः प्रव-  
१२। नमस्तुभ्योः कीर्तिरद्भुतमुद्भवत् विभुवने धावस्वमाकल्पयः ॥ (९) उदितसकलभूमी-  
स्रष्टव्यसिद्धिः स्वयमपि किमपीच्छन्धीयस्य मिथः । अम-  
१३। वदभवभाजः अथवा वन्दुरात्मा हृदयतल्लतसेवः श्रीजयचन्द्रदेवः ॥ (१०) श्रीमन्-  
चाक्षोधिपदस्य शास्त्रापादादिकं मग्नमशेषमेव । काशीप्रदीपामु-  
१४। वदधार यः शासनं शासनकर्षधारः ॥ (११) स्रष्टव्यस्यपाद्योदकान्कौस्तुभवाससं ।  
वन्द्यमानां दिवा मूर्द्धि दत्तताराकृतोत्कराम् ॥ (१२) उपताराधरात्म्यं सिं-  
१५। + + पुरस्सरीम् । श्रीमज्जयपुरे बोधीमव चैतां कृती गुहाम् ॥ (१३) स्रष्टा-  
तिष्ठतां चासामङ्गनेषु निरङ्गः । सोयं श्रीमज्जयमित्रः शास्त्रतीक्ष्णतल्लत + + ॥ (१४)  
१६। + + वेदनयनेन्दुनिष्ठया\*\*संक्षयाकूपरिपाटिलक्षिते । विप्रमाङ्गनरनाद्यवस्थरे =  
कौष्ठमासि युगपद्गदीधयत् ॥ (१५) कायस्यवशंसनीसीदुत्तो मनोरथः  
१७। + + । अकृत प्रशस्तिमेतां मुनिगणचरकाम्भुजधरः ॥ (१६) अस्तिअस्तिता-  
मर्षः श्रीमानेतां पुरन्दरः । उद्धैवदकिरहीरः शिष्यी आराधराभिः ॥ (१७)

*Translation of the above.*

Om! salutation to Buddha.

1. May he, who is of smiling nature, who is of delightfully expanded beauty, who is endowed with the radiance of the sprouts of his internal, thriving, noble and mighty mass of merits, made manifest by the light of the young moons of the large rows of his teeth, who, for the sake of glory, has relieved the three spheres of all illness by bestowing on them the S'āstra—may he be to your welfare.

2. May that lord of regions, the lord, the autumnal moon-light of whose heart is manifest by the resplendence of the glorious light of the world-culightening moon of knowledge, whose benevolent mind appears

strous under the guise of the resplendent row of his pure, rose-coloured  
ails—may he grant you blessings.

8. May he, of the one lock of matted hair, whose mind is engaged  
friendship for those who depend on him, who holds up, like a standard,  
the white light of noble speech, who wields the beautiful scymitar of all-  
prevailing mercy which has made the world fearless—may he promote your  
prosperity.

4. Here lived a noble hermit of the name of S'rimitra, the chief of  
the pure race of Sambuddha, renowned in the three worlds, who had im-  
mured to all beings the secret knowledge (lit. the Mantra) of the noblest  
sacrifice,

5. by whose friendly aid the ferocious, giving up their needless fero-  
city, the passionate forsaking their superabundant anger, the timid aban-  
doning their fear.——Relying on the friendship of him who is the asylum  
radiance in this world, even (wild) animals, endowing themselves with  
love, conversed with each other with affection, diffusing the nectar of  
their delightful eyes. What a wonder!

6. Enamoured by the maiden of emancipation in this life, that person  
undeviating mind, did not by the corner of his eyes, cast even a reproach-  
ful glance at the eight Siddhis, who had achieved the exclusion of all creat-  
ure evils, who were devoted voluntarily to their husband, who delighted in  
the enjoyment of good qualities, and who lying at his feet.——

7. Although devoid of all desires, he, thoroughly versed in all the  
works of Buddha, and, always looking up for high enterprise, through his  
benevolence, was anxious for the salvation of the creation. He, by his  
teachings, made heterodox kings to betake to the worship of S'righana,  
(Buddha).

8. He always bestowed freely even what did not cross the mind of  
givers; beholding which (the jewel) Chintámani, the greatest giver of  
gifts, through shame hid itself in heaven.

9. The work of him who, bathing over and over in the river of end-  
less felicity, had, from the day of his birth, taken the lord proprietor of  
earth and propriety for asylum, who,——having repeatedly touched the  
sanctity of the highest Brahma, had ultimately become unrivalled among  
all men, and of thriving person;——his works had attained a wonderful  
durability for ages.

10. S'ri Jayachchandra Deva, the adored of a hundred kings, the  
devoted from devotion, the perfection of whose glory had spread all over  
the earthly globe, wishing something, became a disciple of one whose know-  
ledge was transparent, and who had renounced the earth.



11. He, becoming the spiritual guide of the king of Kási, and the instructor of law, revived the lost ordinances and the endless scriptures of the Mahábodhi.

12. The three Bodhis——adorned in golden raiment, resplendent as the garlanded cloud of twilight——the adored of day with the forehead decked with a bright star.

13. Bearing a refulgent star——this cave, in the auspicious Jayapura,

14, 15. as also three sacrifices (satras) in the courtyard, the wifeless, and of noble deeds. With reference to the three,—the friend of the world with firm faith at once accomplished in the fortunate year comprising the numbers—the Vedas, (4) the eyes, (2) the moon, (1) (and)——(?) of the era of the Lord of men, Vikramánka, in the month of Jyaishṭha.

16. Manoratha, son of S'risída, of the noblest of the Káyastha race, a bee on the lotus feet of the learned, composed this eulogium.

17. Purandara, the adored of scribes, transcribed this, and the clever artist, named Dhárádhara, engraved it with his chisel.

*Transcript in Devanágari of Inscription No. 2.*

- १ । तदयम् (१) + शायनभरस्य उज्ज्वलस्य शिलाभिदः ॥ +  
 २ । शकाब्देन पुत्रेण महादेवस्तुम्भः ॥ जेष्ठ +  
 ३ । म + + म + + महाबोधिनिवासिनी ॥ स्नातक +  
 ४ । + अक्षयास्तु त्रयेसे प्रतिष्ठापितः पुष्करि-  
 ५ । ख्यत्य(व) + या च पूता विष्णुपदीसमा ॥ वितये-  
 ६ । न सचक्षेण द्रव्याणां खानिता + ता ॥  
 ७ । चङ्चिंशतितमे वर्षे धर्मपाले महाभुजि  
 ८ । भाद्रवकुलपद्म्यां सुनोर्भास्त्र-  
 ९ । रस्याहनि ॥

*Translation.*

For endless virtue and for the good of the inhabitants of Mahábodhi, an image of the four-mouthed Mahádeva was consecrated by S'aka, the son of the noble sculptor, ——sáyanabhara. (?) A tank, holy as the river, born of the feet of Vishnu, was also excavated by him at a cost of three thousand Drummas, on the 26th year of the great king Dharmapála, on the 5th of the wane, on the day of the son of the lord of light, (Saturday).

4. *Description of a new Lepidopterous Insect belonging to the genus Apatura.*—By L. de NICEVILLE, Esq.

This paper will appear in Part II of the Journal.

## LIBRARY.

The following additions have been made to the Library since the Meeting held in March last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,  
presented by the respective Societies and Editors.

- 
- Berlin. Die königliche preuss. Akad. der Wissen.,—Monatsbericht, December 1879.
- Bombay. The Indian Antiquary,—Vol. IX, Part 104, March 1880.
- Bordeaux. La Société de Géographie Commerciale,—Bulletin, Nos. 4, 5 and 6.
- Calcutta. Agricultural and Horticultural Society,—Journal, Vol. VI, Part 2.
- . The Mahābhārata, No. 44.
- Colombo. Ceylon Branch, Royal Asiatic Society,—Journal, 1880.
- London. The Academy,—Nos. 407—411.
- . Anthropological Institute,—Journal, Vol. IX, No. 2, November 1879.
- . The Athenæum,—Nos. 2731—2734.
- . Royal Geographical Society,—Proceedings, Vol. II, No. 2, February 1880.
- . Royal Microscopical Society,—Vol. III, No. 1, February 1880.
- Dallinger, Rev. W. H.*—On a Series of Experiments made to determine the Thermal Death-point of known Monad Genus when the Heat is endured in a Fluid.
- . Nature,—Vol. XXI, Nos. 528, 530, 538—542.
- . Royal Society,—Proceedings, Vol. XXIX, No. 199.
- Living, Prof. G. D. and Dewar, Prof. J.*—Quantitative Spectroscopic Experiments. *Perry, J. and Ayrton, W. E.*—On the Practical Solution of the Most General Problems in Continuous Beams.
- . Statistical Society,—Journal, Vol. XLII, Part 4, December 1879.
- . Society of Telegraph Engineers,—Journal, Vol. VIII, No. 29.
- Preese, J. R.*—Telegraphs in Persia.
- München. Repertorium für Experimental Physik,—Vol. XVI, No. 2.
- Weber, H. F.*—Die Wahre Theorie der Fresnel'schen Interferenz-Erscheinungen. *Isenkrahe, Dr. C.*—Pondelexperimente zur Erklärung der Consonanz-, Interferenz- und Absorptionserscheinungen in der Akustik und Optik.
- Paris. Journal Asiatique,—Vol. XV, No. 1, January 1880.
- . La Société de Géographie,—Bulletin, December 1879.

Palermo. Società degli Spettroscopisti Italiani,—*Memorie*, Dispensa 9, September 1879.

Pisa. Società Toscana di Scienze Naturali, Processi Verbalì, 11th January, 1880.

Yokohama. Asiatic Society of Japan,—Vol. VIII, Part 1, February 1880.

———. Deut. Gesellschaft für Natur-und Völkerkunde Ostasiens,—*Mittheilungen*, February 1880.

### PAMPHLETS,

*presented by the Authors.*

MASON, MRS. E. The Toungoo God-Language Conspiracy. 8vo., Rangoon, 1878-79.

SCHLAGINTWEIT-SAKÜNLÜNSKI, H. VON. Erläuternde Angaben über den IV Band der "Reisen in Indien und Hochasien" nebst Bericht über die landschaftlichen Aufnahmen und die Tafeln. 8vo., München, 1880.

VISHNULALL, MOHUNLALL. Account of the Incarnation of Govardhanatha.

### MISCELLANEOUS PRESENTATIONS.

Archæological Survey Reports, Vol. IX. Report of a Tour in the Central Provinces in 1873-4 and 1874-5. 8vo., Calcutta, 1879.

The Indian Forester,—Vol. V, No. 3, January 1880.

Geological Survey of India,—Records, Vol. XIII, Part 1.

Annual Report of the Geological Survey of India, and of the Geological Museum, Calcutta, for the year 1879. *King, W.*—Additional notes on the Geology of the upper Godavari basin in the neighbourhood of Sironcha. *Lydekker, R.*—Geology of Ladak and neighbouring districts, being fourth notice of Geology of Kashmir and neighbouring territories. Teeth of Fossil Fishes from Ramri Island and the Punjab. *Feistmantel, Dr. O.*—Note on the Fossil Genera *Nöggerathia*, Stbg., *Nöggerathiopsis*, Fstm., and *Rhiptozamites*, Schmalh, in palæozoic and secondary rocks of Europe, Asia and Australia. Notes on Fossil Plants, from Kattywar, Shekh Budin, and Sirgulah. *Clark, G. T.*—On Volcanic Foci of eruption in the Konkan.

#### BENGAL SECRETARIAT.

Scientific Results of the Second Yarkand Mission,—*Rhynchota*: by W. L. Distant.

Geological Survey of India,—Records, Vol. XIII, Part 1.

The Indian Antiquary,—Vol. IX, No. 104, March 1880.

HOME REV. AND AGRICULTURAL DEPARTMENT.

# PERIODICALS PURCHASED.

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Bombay. The Vedārthayātna,—Vol. III, Nos. 13 and 14.

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Göttingen. Gelehrte Anzeigen,—Stücken 2—7.

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Leipzig. Annalen der Physik und Chemie, Vol. IX, No. 2.

*Winkelmann, A.*—Ueber eine Beziehung zwischen Druck, Temperatur und Dichte der gesättigten Dämpfe von Wasser und einigen anderen Flüssigkeiten. *Erner, K.*—Ueber die Newton'schen Staubringe. *Schönemann, P.*—Das Kreuzpendel. Apparat zur graphischen Darstellung der Schwingungscurven.

———. ———. Beiblätter,—Vol. IV, Nos. 2 and 3.

London. Society of Arts,—Journal, Vol. XXVIII, Nos. 1422—1426.

———. Journal of Botany,—Vol. IX, No. 206, February 1880.

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*Capron, Dr. E.*—On the Preservation of Parasitic Hymenoptera.

———. The Entomologist's Monthly Magazine,—Vol. XVI, No. 189, February 1880.

*Goss, H.*—Introductory Papers on Fossil Entomology, No. 11. *Distant, W. L.*—Notes on some Exotic Hemiptera, with descriptions of new species. *McLachlan, R.*—On *Calopterygina* from the Island of Sumatra, collected by Herr Carl Bock.

———. The Ibis,—Vol. IV, No. 13, January 1880.

*Wardlaw-Ramsay, R. G.*—Ornithological notes from Afghanistan. No. II. On the Birds of the Hariab District.

———. The Messenger of Mathematics,—Vol. IX, Nos. 9 and 10, January and February 1880.

———. Annals and Magazine of Natural History,—Vol. V, No. 26, February 1880.

*Cope, E. D.*—On the Genera of *Felidae* and *Canidae*. *Miers, E. J.*—On the *Squillidae*. *Vogt, Prof. Carl.*—On *Archæopteryx macroura*.

———. The Nineteenth Century,—Vol. VII, No. 36, February 1880.

———. The London, Edinburgh and Dublin Philosophical Magazine,—Vol. IX, No. 54, February 1880.

*Perry, J. and Ayrton, W. E.*—A Dispersion-Photometer. *Nipher, P. E.*—The Electric Light.

———. The Publishers' Circular,—Vol. XLIII, Nos. 1018—1020.

———. The Journal of Science,—Vol. II, No. 74.

New Haven. The American Journal of Science,—Vol. XIX, No. 109, January 1880.

*Whitfield, R. P.*—New Forms of Fossil Crustaceans from the Upper Devonian Rocks of Ohio. *Marsh, O. C.*—New characters of Mosasauroid Reptiles.

Paris. Annales de Chimie et de Physique,—Vol. XIX, February 1880.

———. Revue Critique,—Vol. IX, Nos. 7—11.

———. Revue des deux Mondes,—Vol. XX, No. 3 ; Vol. XXXVII, No. 4 ; Vol XXXVIII, Nos. 1 and 2.

———. Journal des Savants,—February 1880.

———. Revue Scientifique,—Vol. XVIII, Nos. 34—38.

———. Comptes Rendus,—Vol. XC, Nos. 6—10.

### BOOKS PURCHASED.

HUME, A. O. and MARSHALL, C. H. T. The Game-Birds, of India, Burmah and Ceylon. Vol. II. Rl. 8vo., Calcutta, 1880.

MALLESON, COL. G. B. History of the Indian Mutiny. Vol. II. 8vo., London, 1879.



PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL,  
FOR MAY, 1880.

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The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 5th instant, at 9.15 P. M.

H. B. MEDLICOTT, Esq., F. R. S., President in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Director, Cambridge Observatory,—Astronomical observations made at the Observatory of Cambridge under the superintendence of J. C. Adams, F. R. S., Vol. XXI, for the years 1861-65.

2. From the Royal Society of New South Wales,—(1) Report of the Council of Education, New South Wales, for 1878, (2) Annual Report of the Department of Mines, New South Wales, for 1877.

3. From the British Museum,—(1) Catalogue of the Oriental Coins in the British Museum; by S. L. Poole, (2) Illustrations of Typical specimens of *Lepidoptera Heterocera* in the collection of the British Museum, Part III, by A. G. Butler, (3) Illustrations of Typical specimens of *Coleoptera* in the British Museum, Part I, by C. O. Waterhouse.

4. From the authors :—

(1) Introduction to the Study of Sign Language among the North American Indians: by Lieut.-Col. G. Mallery, (2) Sacred Books of the East, Vols. I—III: edited by F. Max Müller, (3) Le dixseptième Chapitre du Bharatiya-Nāṭya-Çāstra, intitulé Vag-Abhinaya: by P. Regnaud, (4) Miscellaneous Essays relating to Indian subjects: by B. H. Hodgson, (5) Instructions for Testing Telegraph Lines and the Technical arrangement of offices, Vol. II: by L. Schwendler.

5. From the Maharaja of Kashmir,—a Hindee Almanac.

6. From Lieut. R. C. Temple,—4 silver and 29 copper coins.

7. From the Home, Revenue and Agricultural Department, (1) *Ostindische Kaste in der Gegenwart*: by Dr. E. Schlagintweit, (2) *The Chronology of Ancient Nations*: translated by Dr. C. E. Sachau.

The PRESIDENT then laid on the table Volume II of the *Antiquities of Orissa*, by Dr. Rájendralála Mitra, which had been recently presented to the Society by the author, and in calling attention to this valuable contribution to the Society's Library, he said:

I have the pleasure of presenting a gift in which the Society may take pride as well as interest. It is the second Volume of the *Antiquities of Orissa* by Dr. Rájendralála Mitra. For five and thirty years Dr. Mitra has, I may say, belonged to the Society. It was to him as a school before he made himself a master in the studies to which he has devoted his life. Although this work has been brought out quite independently of the Society, we may truly say that but for the Society, it would never have appeared. I am not competent to judge of the critical merits of a work of antiquarian research—no doubt this volume will sustain in this respect the reputation of its author—but of its form, I may venture to remark, that it seems worthy of the important object undertaken, to make an adequate permanent record of the wonderful monuments of a bygone attempt at civilization in this country. For such investigation it is especially to be regretted that so few of Dr. Mitra's fellow countrymen have endeavoured to emulate the conspicuous example he has set them, for it is surely to be presumed that, with equal learning, a native must have a great advantage over a foreigner in interpreting the symbols of a mythology and of a social phase, the traditions and the residual customs of which formed the elements of his earliest training. The Society can scarcely show a higher sense of the duties of its position than by the encouragement of native learning.

The following Gentlemen, duly proposed and seconded at the last Meeting, were balloted for and elected Ordinary Members—

R. H. MacLeod, Esq., C. S.

Rao Sahib Visvanáth Mandalik, C. S. I.

Babu Taraprasad Chatterjea.

The following Gentlemen are candidates for ballot at the next Meeting—

1. The Rev. J. S. Doxey, Multan, proposed by Col. C. C. Minchin, seconded by J. Crawford, Esq.

2. G. MacDonald, Esq., C. E., Aligarh, proposed by H. Rivett-Carnac Esq., seconded by A. Pedler, Esq.

3. J. G. W. Sykes, Esq., LL. D., Barrister at Law, Lukhnau, proposed by H. Rivett-Carnac, Esq., seconded by A. Pedler, Esq.

4. The Giridhararaj of Biswan, proposed by Dr. Rájendralála Mitra, seconded by J. Crawford, Esq.

The SECRETARY reported that Mr. J. C. MacDonald and Col. H. A. Browne had intimated their desire to withdraw from the Society.

The PRESIDENT announced that the Council propose certain amendments to Rules 4 and 46 :

The object of these amendments will be seen from the following circular which was issued to all resident members in compliance with Rule 64 A.

Proposition to increase the strength of the Council.

The peculiar circumstances in which the Society is placed make it very desirable, or even necessary to working efficiency, to increase the strength of the Council.

There are always attached to the Supreme and the Local Governments men whose counsel it is important to secure. With the present limit of the number of the Council to 15 members this advantage cannot be attained, owing to the removal of all the chief offices to the hills during the hot season, whereby the administrative body of the Society would then be left inefficient for the greater part of the year. This difficulty has for some time been partially met by making frequent changes in the Council within the year, but it is not always possible to effect a move of this kind, and the practice is independently objectionable.

The law requiring that the Trustees of the Indian Museum appointed by the Society shall be members of the Council has added greatly to the difficulty under consideration : these four Trustees (or five, when the President is already a Trustee) should be working (and some, at least, non-migratory) members of Council ; and the office-bearers of the Society (the 3 Secretaries) are not always those who can most fitly be nominated as Trustees.

The rule whereby the President must be chosen from the Council has sometimes been felt obstructively ; and, indeed, the object of such a rule is not apparent. This difficulty also would be neutralized if the Council had power to nominate some additional members to its body.

The appointment of these additional members should remain optional, the special object being—to have power in emergent cases to bring in some particular individual without requiring the immediate retirement of some actual member of Council ; but the member so appointed would be as fully and permanently on the Council as any other. The desired relief could not be secured by a less number than five.

The change will require the following alterations of the Rules, (additions in italics) :

Rule 4. "The administration, direction and management of the affairs of the Society shall be entrusted to a Council composed of the officers of the Society—namely, a President, three Vice-Presidents, and one or more Secretaries, including the Treasurer—with as many other ordinary members, as shall with these officers make up *minimum total of fifteen, or a maximum of twenty.*"

"Not more than one of the offices of President, Vice-President or Secretary, shall be held by the same individual ; but the Secretary if there be one, or one of the Secretaries, if there be more than one, shall ex-officio act as Treasurer. *The optional vacancies in the Council are intended to provide (under Rule 46) for emergent cases, such as are occasioned by the frequent temporary absence of members, or otherwise.*"



Rules 46. "In the event of a vacancy occurring during the year in the office of President, Vice-President, Secretary, or Member of Council, it shall be competent to the remaining Members of the Council to fill up such vacancy, subject to the confirmation of the next subsequent Ordinary General Meeting.

*"The Council may also, for specified reasons and subject to the same confirmation, elect additional members, as occasion may require, within the sanctioned maximum number."*

The PRESIDENT invited the members present to make any remarks or suggestions on the proposed alterations, reminding them that under the rules a statement of such objections would have to accompany the voting papers, which would be sent round to all members of the Society.

No remarks or suggestions having been made on the proposals, the President stated that the proposals would be circulated, and the questions would come up again at the July meeting.

The PRESIDENT on behalf of the Council then announced that Mr. A. Pedler had been appointed General Secretary, Member of Council and Trustee of the Indian Museum, on behalf of the Society, in the place of Mr. J. Crawford who had gone to England.

The PRESIDENT also announced that Mr. H. F. Blanford had tendered his resignation as Member of the Council, and Mr. Beverley as Treasurer, and that Mr. J. C. Douglas had been appointed Member of Council and Treasurer in their place.

The SECRETARY announced that the following works had been sanctioned for publication in the Bibliotheca Indica Series :

1. Chāṇḍa's Prākṛit Grammar ; edited by Dr. A. F. R. Hoernle.
2. Second Volume (English Translation) of the Ain-i-Akbari ; by Captain H. W. Clarke.
3. Maghāzī el Wāqidi ; edited by Mr. C. J. Lyall.
4. Maitrāyaṇi Samhitā ; edited by Dr. L. Schroeder.
5. English translation of the Kathā Sarit Sāgara, by Mr. C. H. Tawney.
6. Viṣṇu Sūtra ; edited by Prof. Jolly.
7. English Translation of the Charaka ; by Dr. Mahendralāla Sircar.
8. Kāthaka Grihya Sūtra ; edited by Dr. G. Thibaut.
9. English Translation of the Tarikh-ul-Khulfa ; by Major H. S. Jarrett.
10. Nirukta, with commentary ; by Pandit Satyavrata Samāśrami.
11. Third volume of the Akbar Namah ; edited by Maulvi Abdurrahim.
12. Continuation of the Isabah ; edited by Maulvi Abdul Hai.

Dr. A. F. R. HOERNLE exhibited four silver, and twenty-nine copper coins, and some ornaments received from Lieut. R. C. Temple, and read the following note on them by Dr. Rájendralála Mitra.

"Two of the silver coins have been so worn out that the legends on them have become illegible. The 3rd is a coin of Ala-uddin Muhammad bin A. H. 695 to 715. It has been figured by Thomas in his *Pathans of Delhi*, Plate III, fig. 57, page 171. The legend on the fourth is very faint, and I doubtfully take it to be of the same reign but of different type.

"The copper coins are all of the same reign and type, but not of the same date. On some I make out the date to be A. H. 896, in others 905, 917 and 918. They belong to the reign of Sikandar Shah Behloli (Shah Lodi, Lodi,) and have been figured by Thomas, plate V, figs. 167 and 168, page 366.

"The large ornament is a necklet of a pattern common all over India. The small ones are earrings. They are of no interest except that the like of them may be seen in figures of ancient and mediæval ornaments of the same kind."

Dr. A. F. R. HOERNLE read the following Memorandum from Mr. H. de la Motte-Carnac, C. S., C. I. E., F. S. A., giving extracts from a letter from the Chevalier Hans Hildebrandt, regarding the resemblance between the Swedish Tumuli and the Indian Pre-historic Tumuli and Markings.

"The following extracts from a letter from the Chevalier Hans Hildebrandt, Antiquary to the kingdom of Sweden, Director of the Royal Swedish Academy of History and Antiquities, in which he notices the resemblance between the Swedish Remains, and the Indian Prehistoric Tumuli and Markings described in the papers read by me before the Asiatic Society, perhaps be of interest. Referring to the cup-marks, M. Hildebrandt writes :

"The ancient sculpturings on the Indian rocks are highly interesting. Regarded as a whole they are more like to the Scotch sculpturings than to the Swedish ones, as you will see from the enclosed plate, showing some of the characteristic groups of the Swedish type.

"The cup-marks occur in Sweden very oft, but seldom or never on standing surfaces, never, as far as I know, on natural rocks, generally on the smoothest horizontal or quasi-horizontal surface of large or smaller blocks, one of the volumes of the monthly papers of our academy, which I sent you to-day, you will find such a block with a certain number of cup-marks engraved. The cup-bearing blocks are called by the Swedish peasants *elfstenar* or stones of the elfies. The cups are used as receptacles of offerings. They are greased and in them are deposited small gifts to the supernatural

beings, such as pins, farthings, &c. This custom is in some places retained even to-day. Count G. Essen, who died some years ago, had placed in his park, where only the families of his estate entered, an Elfstone, and after a week he found several deposits in the cups. He took them away, but after another week the cups were rich in small objects. No friend of superstition, he told his labourers that they were not allowed to deposit offerings on the stone. The labourers obeyed but reluctantly. They were persuaded, that the Count had taken the stone from the field and placed it in his park only to have a place of offering continually at hand, and his prohibition to use it was regarded as a proof that he wished to use the said stone only for himself.

“The monoliths are very common in Sweden, but generally very rough. I know only a single instance, where the stone shows a kind of ornament (a spiral line) in the province of Halland.

“Elf cups are often found in Sweden on the covering blocks of our dolmens. The dolmens belong in Sweden exclusively to the Stone-age, but I am not quite sure if the cup-marks on them can be ascribed to so high an antiquity. The cup-bearing blocks could be visible in other prehistoric periods as they are to-day, and in that way they do not necessarily belong to the times of erection of the dolmen itself,”

“It is to be noticed that in some parts of India also flowers and offerings are to be found on the sculptured stones and at Junapanee as in Sweden the cup-marks were as in Sweden generally on the “uppermost horizontal or quasi-horizontal surface of the large or smaller blocks.” In India the rocks with the markings are attributed to the *Pandus*, who although hardly to be regarded as elves, represent in the minds of the people a supernatural agency.

“Referring to the Tumuli M. Hildebrandt writes :

“The likenesses between your Indian Tumuli and our Swedish ones are of so general a kind, you will find the same arrangement everywhere, that I fear no conclusions are thence to be drawn. But your finds are of the highest interest. Your iron axes have exactly the same type as the very fine metal axes of Europe, the only type seasonable in the age, when man learned to have recourse to metal instead of stone for making an axe. I think we have two ways of explaining this phenomenon. Either your Indian iron-implements have no connection at all with the development of European civilisation, and then they are to be regarded as belonging to a quite distinct civilisation, which, quite independently left the stage of the stone-implements and made itself new ones of metal, of iron, which, to be sure in some regions, for instance in South Africa, has been known and used earlier than copper and bronze. Or your Indian finds belong to the same great wave of civilization we have in Europe, but in India iron was known

very early ; already in the very first period of the knowledge of metals, copper or bronze was given up and replaced with iron, a very interesting fact. To choose between the two theories it will be necessary to have the exact date of these finds, and to that end it will be necessary to have some researches more in the same direction.' "

"It is impossible at present to give even approximately the date of the Tumuli—all the people can tell you is that they are prehistoric.

"The following extract regarding the remains of snake-worship in Sweden will be considered interesting :

" ' There is still in Sweden to be found a snake-worship in a tame way. We have in Sweden a quite innocent snake, Swed-Snok (the same word as in English!) which lives in heaps of stones, in the foundations of country-houses &c., and is regarded as a tutelary genius of the house. As a boy I killed a *snok* and was very proud of my bravery, till my old grandmother heard of it and made me so angry reproaches that I promised never to do so any more. In Pompeii you will find almost in every house the tutelary snakes painted, especially in the kitchens.' "

The REV. FATHER E. LAFONT, S. J. read the following note on some anomalies he had observed in one of Crookes' Electrical Radiometers, and exhibited to the members the difference in behaviour of this instrument, and that of the ordinary form of electrical radiometer.

An Electrical Radiometer recently made for me by Mr. C. H. Gimmingham the Assistant of Mr. W. Crookes, behaves in a manner so different from that mentioned in the latter's Lecture "On Radiant Matter," that I thought it might interest the meeting to have it exhibited to-night.

According to Crookes, the vanes of his Radiometer revolve when made the negative pole of the Inductarium, but remain perfectly motionless when the current is reversed, and when the vanes become positive. Now in this particular instrument with a weak primary current, the phenomena take place just as they were exhibited at Sheffield, but if more battery power be added, it becomes impossible to prevent the rotation by reversing the current, in both positions of the commutator the luminous appearances and the rotatory movement remain unaltered, except perhaps in intensity.

The explanation of this anomaly is, I think, the following :

We have in the Secondary Coil of our Inductarium, a rapid succession of two induced currents produced by the *closing* and the *opening* of the primary or battery current ; but of these two induced currents, that produced at opening is far stronger than the one produced at the closing of the primary. It follows from this, that if a great resistance be interposed between the terminals of the Secondary Coil, the stronger current alone passes, and it is from this that these terminals are usually called *positive* or

*negative.* In the present case an additional battery power very likely so far increases the tension of the weaker current that on reversing the commutator, that current plays the part which usually devolves upon the stronger current alone. The vanes of the Radiometer contain always *negative* electricity, in one position of the commutator from the *direct*, and in the other position from the *inverse* induced current, and when that *negative* electricity has sufficient tension it drives the vanes in both cases. This new fact proves once more the comparative indifference of positive, and the peculiar energy of negative electricity in these highly rarified tubes.

The following papers were read—

*Second Notice of the Coins of the Mitras.*—By A. C. CARLLEYLE, ESQ.  
*Archæological Survey of India.*

(Abstract.)

This paper mainly treats of a new device discovered by the author on some of the Mitra coins, acquired by Mr. Rivett-Carnac on a subsequent occasion, and noticed by him in a paper read at the last meeting of the Society (see Proceedings for April). This device is the recumbent figure of a man, which takes the place of the three symbols on the other coins. The author identifies it as Buddha in his nirvána, in the same recumbent posture as represented by the colossal statue of the nirvána, discovered by him on the site of Kusinagara. The paper further shows that all Mitra coins may be divided into three classes, according to their devices on the reverse. The first class has a bull standing; the second, a peacock and palm-tree; the third, a chaitya or stúpa of three semicircular arches. The two latter classes again, show the standing bull on their obverse, while the first class has the Buddhist triśúla in its place. The author states that 14 kings of the Mitra dynasty are now known, whose dates he says range from B. C. 178 to A. D. 144.

This paper will be printed in the Journal, Part I.

2. *On a simple Method of identifying a submerged Telegraph Cable without cutting it.*—By W. P. JOHNSTON, ESQ., *Officiating Electrician, Indian Government Telegraphs.*

(Abstract.)

This paper refers to a simple and very ingenious method for identifying any submerged telegraph cable without making the highly objectionable cut, when the cable has been raised to a boat. For instance, say that there are two identical cables laid across a river, one of which has become faulty, how can the faulty one be distinguished without cutting either cable? Mr. Johnston uses for this purpose a telephone which, as is well

known, is the most sensitive instrument at present available for indicating small currents acting for very short intervals of time. After having given orders on shore that signals are to be sent, only through the good cable, Mr. Johnston attaches a telephone to the wire guards of the raised cable, the distance between the two connecting points being not necessarily greater than 6 feet; if then it should happen that the cable, to which the telephone is attached, is the one through the copper conductor of which signals are being sent, and into the wire guards of which small and opposite currents are consequently induced, and of which currents small portions pass through the shunt formed by the telephone, then every signal sent through the cable can be distinctly read, and the Telegraph Engineer on board knows that he has got hold of the good cable. If no signals can be heard in the telephone, then it is the faulty cable that has been raised to the boat.

The reverse way may also be chosen, by connecting a telephone to the conductor of the cable on shore, and sending signals from a battery on the boat, through the wire guards; in this manner the Telegraph Engineer on the boat has the means of communicating with the shore.

After the paper was read Mr. Louis Schwendler gave a lucid description of this ingenious method for applying the telephone to practical purposes, illustrating his remarks by diagrams on the black board, and carrying out some experiments with a piece of cable as used for Indian rivers. The members present satisfied themselves as to the efficiency of the method, and two signallers of the Government Telegraph Department communicated with each other in the manner above described.

Mr. Schwendler further said that the telephone, although a very interesting instrument and of great practical importance for physical research, appeared to him a most dangerous one from a telegraph point of view, for it could be used for taking off at any point, the messages passing along a line of telegraph, and it could not be detected by the ordinary means of testing. He said it was well known that during the cotton crisis in Bombay, certain people interested in cotton messages, had started an intermediate office in the jungle, by which means they carried off the messages and falsified them; but that if a case of this sort happened now, it would be at once detected by the nearest testing office, whereas by the application of a telephone, acting as a shunt between any two points of a telegraph wire, no such detection would be possible.

The paper will be published in the Journal, Part II.

The following communications have been received:—

*On some Points in the Dentition of Rhinoceros.*—By RICHARD

LYDEKKER, Esq., B. A.

*On the extra-floral Nectar-glands of Aphelandra cristata,* Robert Brown.—By J. WOOD-MASON, Esq.

*On the Genus Chæradodis.*—By J. WOOD-MASON, Esq.

## LIBRARY.

The following additions have been made to the Library since the Meeting held in April last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,  
presented by the respective Societies and Editors.

- Bombay. The Indian Antiquary,—Vol. IX, Part 105, April 1880.
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- . Geological Society,—Quarterly Journal, Vol. XXXVI, No. 141, February 1880.
- . Royal Astronomical Society,—Monthly Notices, Vol. XL, Nos. 3 and 4, January and February 1880.
- . Royal Asiatic Society of Great Britain and Ireland,—Journal, Vol. XI, Part 3, August 1879; Vol. XII, Part I, January 1880.
- . The Academy,—Nos. 412—414.
- . The Athenæum,—Nos. 2735—2737.
- . Nature,—Vol. XXI, Nos. 544 and 545, April 1880.
- No. 545. Musical Pitch. *Ellis, A. J.*—The History of Musical Pitch.
- Palermo. Società degli Spettroscopisti Italiani,—Memorie, Disp. 10, 11, and 12.
- Paris. La Société de Géographie,—Bulletin, January and February 1880.
- Roorkee. Professional Papers on Indian Engineering,—Vol. IX, No. 36, April 1880.
- Sydney. Royal Society of New South Wales,—Journal and Proceedings, Vol. XII, 1878.
- Vienna. Die kaiserliche Akademie der Wissenschaften,—Almanach für 1879.
- . Archiv für österreichische Geschichte,—Vol. LVII, Part II; Vol. LVIII, Parts I and II.
- . Fontes Rerum Austriacarum,—Vol. XLI, Parts I and II.
- . Sitzungsberichte, mathematisch-naturwissenschaftliche Classe,—Part I, Vol. LXXVII, No. 5; Vol. LXXVIII, Nos. 1 to 5. Part II, Vol. LXXVII, Nos. 4 to 5; Vol. LXXVIII, Nos. 1 to 5; Vol. LXXIX, Nos. 1 to 3. Part III, Vol. LXXVII, Nos. 1 to 5; Vol. LXXVIII, Nos. 1 to 5; Vol. LXXIX, Nos. 1 to 5.
- Part I, Vol. LXXVII, No. 5. *Fuchs.*—Studien über die Gliederung jüngeren Tertiärbildungen Ober-Italiens. *Diethl.*—Untersuchungen über die Organisation des Gehirns wirbelloser Thiere. I Abtheilung (Cephalopoden, Tethys). *Stossich.*—Beiträge zur Entwicklungsgeschichte der Chaetopoden.

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*presented by the Authors.*

HODGSON, B. H. Miscellaneous Essays relating to Indian subjects. 2 Vols. 8vo., London, 1880.

MALLERY, LIEUT.-COL. G. Introduction to the Study of Sign Language among the North American Indians. 4to., Washington, 1880.

MÜLLER, F. MAX. The Sacred Books of the East. Vols. I to III. 8vo., London, 1879.

REGNAUD, P. Le Dix-Septième Chapitre du Bhāratiya-Nāṭya-Śāstra, intitulé Vag-Abhinaya. 4to., Paris, 1880.

SCHWENDLER, L. Instructions for Testing Telegraph Lines and the Technical Arrangement of Offices. Vol. II. 8vo., London, 1880.

### MISCELLANEOUS PRESENTATIONS.

Astronomical Observations made at the Observatory of Cambridge. Vol. XXI, for 1861, 1862, 1863, 1864, and 1865. 4to., Cambridge, 1879.

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Report on the Sanitary Administration of the Punjab for 1878. 4to., Lahore, 1879.

GOVERNMENT OF THE PUNJAB.

SACHAU, DR. O. The Chronology of ancient Nations, an English version of the Arabic Text of the Athār-ul-Bākiya of Albīrūnī, or "Vestiges of the East." 8vo., London, 1879.

SCHLAGINTWEIT, DR. E. Ostindische Kaste in der Gegenwart. Sm. 8vo., Pamphlet.

The Indian Antiquary,—Vol. IX, Part 105, April 1880.

HOME, REVENUE AND AGRICULTURAL DEPARTMENT.

Annual Report of the Department of Mines, New South Wales, for 1877. 4to., Sydney, 1878.



Report of the Council of Education upon the Condition of the Public Schools and of the Certified Denominational Schools, New South Wales, for 1878. Rl. 8vo., Sydney, 1879.

ROYAL SOCIETY, NEW SOUTH WALES.

BUTLER, A. G. Illustrations of Typical Specimens of Lepidoptera Heterocera in the collection of the British Museum. Part III. 4to., London, 1879.

POOLE, S. L. Catalogue of the Oriental Coins in the British Museum. 4 Vols. 8vo., London, 1875-79.

WATERHOUSE, C. O. Illustrations of Typical Specimens of Coleoptera in the collection of the British Museum. Part I, Lycidæ. 8vo., London, 1879.

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### PERIODICALS PURCHASED.

Calcutta. The Calcutta Review,—Vol. LXX, No. 140, April 1880.

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Göttingen. Göttingische gelehrte Anzeigen,—Nos. 8 to 11.

———. Nachrichten,—No. 5.

London. The Journal of Science,—Vol. II, No. 75, March 1880.

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———. The Quarterly Journal of Pure and Applied Mathematics,—Vol. XVII, No. 65, February 1880.

———. Annals and Magazine of Natural History,—Vol. V, No. 27, March 1880.

———. London, Edinburgh, and Dublin Philosophical Magazine,—Vol. IX, No. 55, March 1880.

———. The Entomologist,—Vol. XIII, No. 202, March 1880.

———. The Entomologist's Monthly Magazine,—Vol. XVI, No. 190, March 1880.

———. The Messenger of Mathematics,—Vol. IX, No. 107, March 1880.

———. The Numismatic Chronicle,—Vol. XIX, No. 76, Part IV of 1879.

———. The Nineteenth Century,—Vol. VII, No. 37, March 1880.

———. The Publishers' Circular,—Vol. XLIII, No. 1021.

———. Society of Arts,—Journal, Vol. XXVIII, Nos. 1427 to 1429.

No. 1427. *Heaton, C. W.*—Balmain's Luminous Paint.

No. 1429. *Haughton, B.*—The Best Route for a Line of Railway to India.

London. The Chemical News, Vol. XLI, Nos. 1061—1063.

No. 1061. *Meyer, V.* and *Züblin, H.*—A contribution to the knowledge of Chlorine.

No. 1062. *Meyer, V.* and *Züblin, H.*—On the density of Bromine Vapour at a Yellow Heat.

*Meyer, V.*—On the behaviour of Iodine at Elevated Temperatures.

New Haven. The American Journal of Science,—Vol. XIX, No. 110, February 1880.

Paris. Comptes Rendus,—Vol. XC, Nos. 11—13.

No. 12. *Faye.*—Sur l'origine du système solaire.

———. Revue Scientifique,—Vol. XVIII, Nos. 39—41.

No. 40. *Breguet, A.*—Les Progrès de la télégraphie électrique.

———. Revue Critique,—Vol. IX, Nos. 12—14.

———. Revue des deux Mondes,—Vol. XXXVIII, Liv 3.

*Carrau, L.*—L'humanité primitive et l'évolution sociale, d'après M. Herbert Spencer.

———. Journal des Savants,—March 1880.

———. Annales de Chimie et de Physique,—March 1880.

*Amagat, E. H.*—Memoire sur la compressibilité des gaz à des pressions élevées.

*Cailletet, L.*—Sur la mesure des hautes pressions.

### BOOKS PURCHASED.

HEWITSON, W. C. Exotic Butterflies. Parts 84, 87 to 92 ; 94 to 100.

HUXLEY, T. H. The Crayfish : an Introduction to the Study of Zoology. Sm. 8vo., London, 1880.

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———. ———. Supplement,—Parts 1 to 3.





PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL,  
FOR JUNE, 1880.

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The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 2nd of June, at 9.15 P. M.

H. B. MEDLICOTT, Esq., F. R. S., President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Edinburgh Botanical Society,—Report on the Temperatures during the winter of 1878-79 at the Royal Botanical Garden, Edinburgh.

2. From the Madras Government,—Standing Information regarding the Official Administration of the Madras Presidency in each Department, by C. D. MacLean.

3. From J. O. N. James, Esq., Assistant Surveyor General,—A Chart of India, in two Sheets.

4. From the Home, Revenue, and Agricultural Department,—(1) Jungle Life in India, by V. Ball, and (2) Select extra Tropical Plants readily eligible for industrial culture or naturalisation, by Baron Ferdinand von Müller.

5. From the Trustees, Astor Library,—Thirty-first Annual Report of the Trustees of the Astor Library for the year ending December 31st, 1879.

6. From the Royal Astronomical Society,—Memoirs, Vol. XLI. Observations made during total Solar Eclipses, by A. C. Ranyard.

The following Gentlemen, duly proposed and seconded at the last Meeting, were balloted for and elected Ordinary Members—

The Rev. J. S. Doxey.

J. MacDonald, Esq., C. E.

J. G. W. Sykes, Esq., LL. D.

The Giridhararaj of Biswan.

The following Gentlemen are candidates for ballot at the next Meeting—

1. P. Johnston, Esq., proposed by L. Schwendler, Esq., seconded by J. Wood-Mason, Esq.
2. J. M. Coates, Esq., M. D. Principal, Medical College, (re-election), proposed by J. Wood-Mason, Esq., seconded by H. B. Medlicott, Esq.
3. The Rev. Arthur Lewis, B. A., Dera Ghazi Khan, proposed by Lt. R. H. C. Tufnell, seconded by A. Pedler, Esq.

The SECRETARY reported that Mr. W. E. Brooks and the Hon'ble G. G. Morris had intimated their desire to withdraw from the Society.

Dr. HOERNLE exhibited a sealing-wax impression and sketch of a curious gold medal sent for the inspection of the Society by Thos. A. M. Gennoe, Esq., of Fyzabad, and read the following note on it by Dr. R. Mitra, addressed to the Philological Secretary. "I can make nothing of Mr. Gennoe's drawing and sealing-wax impression. The letters are, as you say, too modern to be of 57 B. C., and they do not convey to me the faintest idea of Vikramāditya. I read them very doubtfully *Srī २ sāmijña janhu*, perhaps the name of a Gosain. The thing is not a coin but a medal. The idea of Vikramāditya has probably originated from the skulls on the obverse, but I feel satisfied that the medal has nothing to do with the originator of the Samvat era. It is desirable that the authenticity and antiquity of the thing should be carefully ascertained before it can be published. Mr. Gennoe does not give its history. The Lat character copper-plate palmed on Mr. Smith should put us on our guard."

Dr. Hoernle explained that Mr. Gennoe had thought the object to be a coin of Vikramāditya and of the first year of his era; but that he believed, with Dr. R. Mitra, that it was not a coin but, if anything at all, perhaps a medal of comparatively modern, possibly of quite recent, date. He was inclined to read the legend: *श्री २ सामी जी जह* (or *जहु*), the last word occurring as a Rājput name, and the numeral probably being "2," a common way of indicating the repetition of the preceding word. The medal is about 2 inches across. The obverse shows the walking figure of a man, carrying two skulls, suspended by straps, one from each shoulder. The reverse bears the above-mentioned inscription in large, somewhat illegible, modern Nāgarī characters.

Dr. Hoernle exhibited a MS. of a hitherto unknown Prākṛit Grammar, called Prākṛtānanda by Raghunātha. He stated that the MS., which was lent to him by his friend, Paṇḍit Rāma Miśra in Benares, was a modern Nāgarī copy of an original in Bengālī characters which once belonged to the Bengālī Head-Paṇḍit, Trilochana Bhaṭṭāchārya, at the Court of Dhulip

Singh in Lahore. He had not seen the original, and did not know what had become of it. The Nāgari copy, which was very carefully written, had been prepared for his own use by Paṇḍit Rāmadatta of Amritsar. The MS. bears the following subscription: *iti śrī jyotirvit-sarasūtma-jaraghunātha-kavi-kaṇṭhīrava-viruchite prākṛtānande dvitīyaḥ parichchhe-daḥ samāptaḥ, prākṛtānandaḥ cha; samvat 1893*. As this subscription shows, the work is divided into two sections; but each section is divided into a number of subsections, which are not numbered, but merely indicated by *iti*; e. g., *iti samdhiḥ* (I, 1), *ity ajantāḥ pumlingāḥ* (I, 2), etc. The work contains no more than Vararuchi's rules, but is not without interest, inasmuch as it completely re-arranges Vararuchi's sūtras on a system resembling that of the Laghu Kaumudī with regard to Pāṇini. The first section treats of Declension, with the exception of the first subsection which is devoted to rules on sandhi. The second section treats of Conjugation. The subsection on sandhi contains the following seven sūtras of Vararuchi in the order indicated: Vr. IV, 1. 12. 13. 14. 15. 16. 17. In the last sūtra, i. e. Vr. IV, 17, the MS. reads correctly भयि (for ययि), which is also the reading of the MS. mentioned in the Proceedings for March 1879 (here called F). It is a curious fact that the readings of that MS. of Vararuchi, which also belonged to Paṇḍit Rāmadatta, as well as the readings of Cowell's MS. W, are found in this MS. of the Prākṛitānanda. Thus, for Vr. 5, 16. this MS. reads अस सोच यूलं with MS. F, and adds पाठांतरे तु । अस सो वो वाऽलं यूलं च with MS. W. Again after Vr. IX, 10 it adds, with MS. W, the sūtra अच्चा अचो दुःसाद्येपविस्त्रापनेषु, and adds a long remark to explain the repetition of अच्चा. Again for Vr. VIII, 37. its commentary runs thus चि चये । अस्मि भिज्जा इत्यादेशः स्यात् ॥ अयति भिज्जः इ भिज्जार ॥ भिज्जभिज्जावयेके, as in MS. F; (or भिज्ज, भिज्जइ, भिज्जए; the letters are not quite distinct. In Vr. VIII, 69 it reads लिचच्च. For Vr. VIII, 7 it reads, with MS. F, बुदो लोचः and example लोचइ, but adds, with MS. W, लोच इति पाठे लोचइ. In Vr. VIII, 59 it reads दुहि-लिहि-वहां दुवभ-लिभ-वभः and examples दुवभइ लिभइ; the conjunct वभ is unmis-takeable, वभ being written very differently. These are only a few of its noteworthy readings. The following may serve to show the arrangement of the Grammar. The second subsection of the first section treats of the declension of masculine nouns ending in vowels. It contains 145 of Vararuchi's sūtras in the following order: Vr. V, 1. II, 42. II, 2. VI, 63. V, 2. V, 11. 12. V, 3. 4. 5. VI, 64. V, 8. V, 6. 7. V, 9. V, 13. V, 10. V, 27. IV, 6. I, 1. I, 3. I, 29. III, 62. II, 8. III, 3. III, 50. III, 1. III, 15. III, 64. II, 31. III, 2, &c., &c. Then follows a subsection on feminine nouns ending in vowels, and another on neuter nouns ending in vowels. Then follow three subsections on masculine, feminine and

neuter nouns ending in consonants ; and one more on indeclinables. The second section treats in six successive subsections on the following *tenses* ; *laṭ*, *liṭ*, *luṭ*, *lṛṭ*, *loṭ* (with *lan*, *lin*, *ásirlin*), *luṇ*. Then follow ten subsections on the irregular verbs, arranged according to the 10 classes. Then come two subsections on the formation of the Causal and the Passive. Lastly there is one subsection on the derivation of words by nominal suffixes ; this contains the following *sútras* : Vr. VIII, 2. VIII, 5. VII, 82. VIII, 62. VIII, 55. IV, 23. VIII, 16. IV, 24. VII, 10. The last three sections of Vararuchi's Grammar on the subordinate Prákrit dialects are omitted in the Prákritánanda, which accordingly might be thought to be incomplete, but for the final statement in the subscription above quoted. A copy of the MS. of this work has been retained by Dr. Hoernle.

Dr. HOERNLE exhibited some brass coins found in a well near the Grand Trunk Road and read a memorandum on the same by H. Rivett-Carnac, Esq.

Mr. Rivett-Carnac says :

I submit for the inspection of the Society specimens of brass coins made over to me by Mr. D. T. Roberts, C. S.

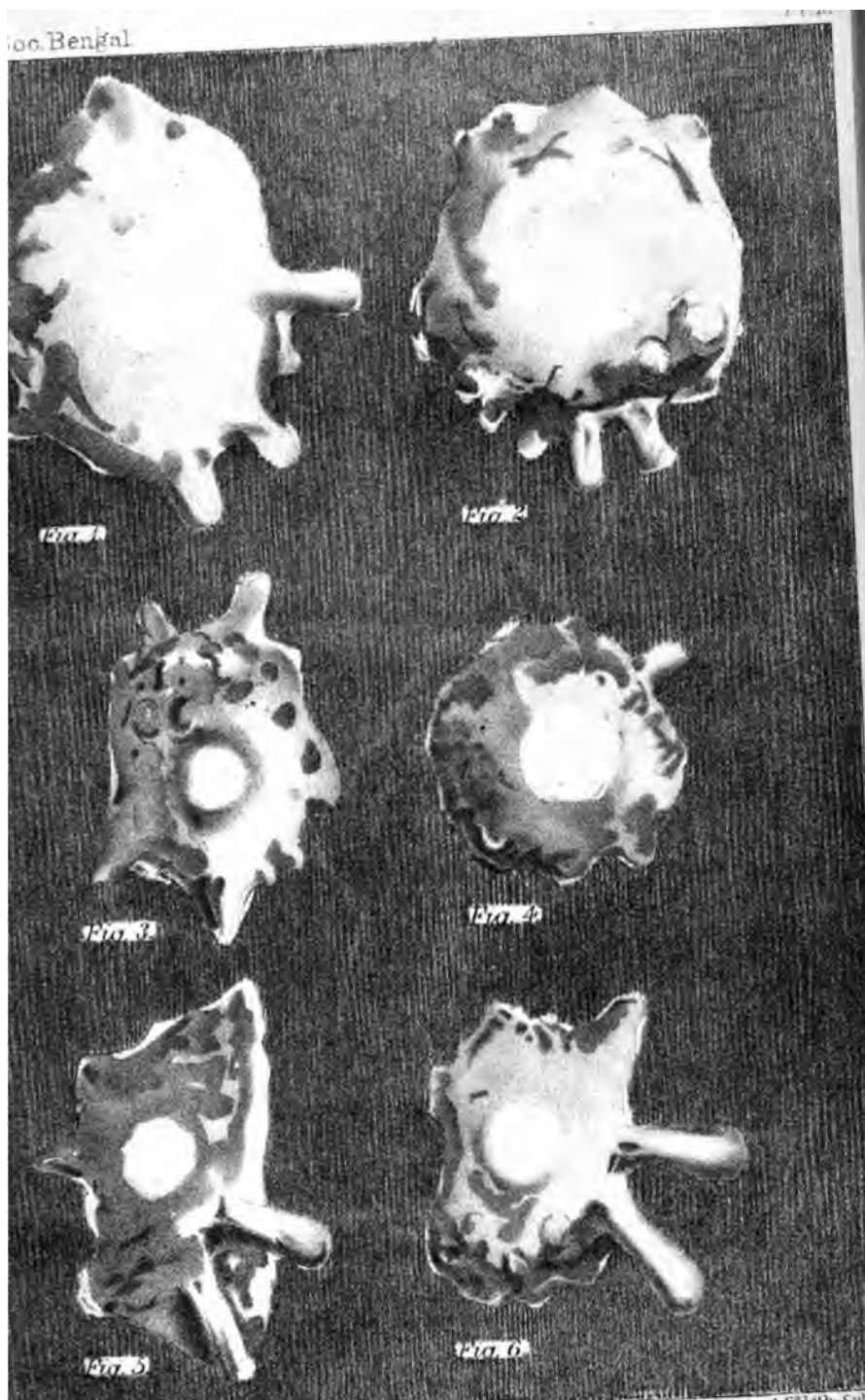
Upwards of  $1\frac{1}{2}$  maunds weight of these coins were recently found in a well near the Grand Trunk Road in the Fatehpur District, N. W. P.

They were found in bulk, *i. e.*, loose, and not in a bag, or box or earthen pot. Dr. Rudolf Hoernle to whom I sent two or three specimens for identification has pointed out that they are Chinese coins of the type described by Marsden p. 828 and are of king Kienlong, or Kaontsoux-shen of the Manchu Dynasty who reigned up to 1795, A. D. and of King Kiakung son of the preceding king.

I now send a considerable number, many of which seem to bear different legends. On one side the letters are distinctly Chinese. On the other they bear a striking resemblance to Arabic characters. It is difficult to account for this large find of Chinese coins in a well on the Grand Trunk Road.

Mr. WOOD-MASON exhibited a small collection of Butterflies from the Andamans and read some notes thereon by Mr. de Nicéville and himself.

Thirty-five species only are included in the present list, of which one is an apparently new species of *Papilio* closely allied to the continental *P. anti-phates*, of which it appears to be the Andaman representative, and from which it differs in the much greater extent of the black bands of the forewings, and the much more strongly expressed black markings, the more extensive grey area, and the black-mottled median area of the hind-wings.



HAILSTONES CALOUTTA. (nat. size.)



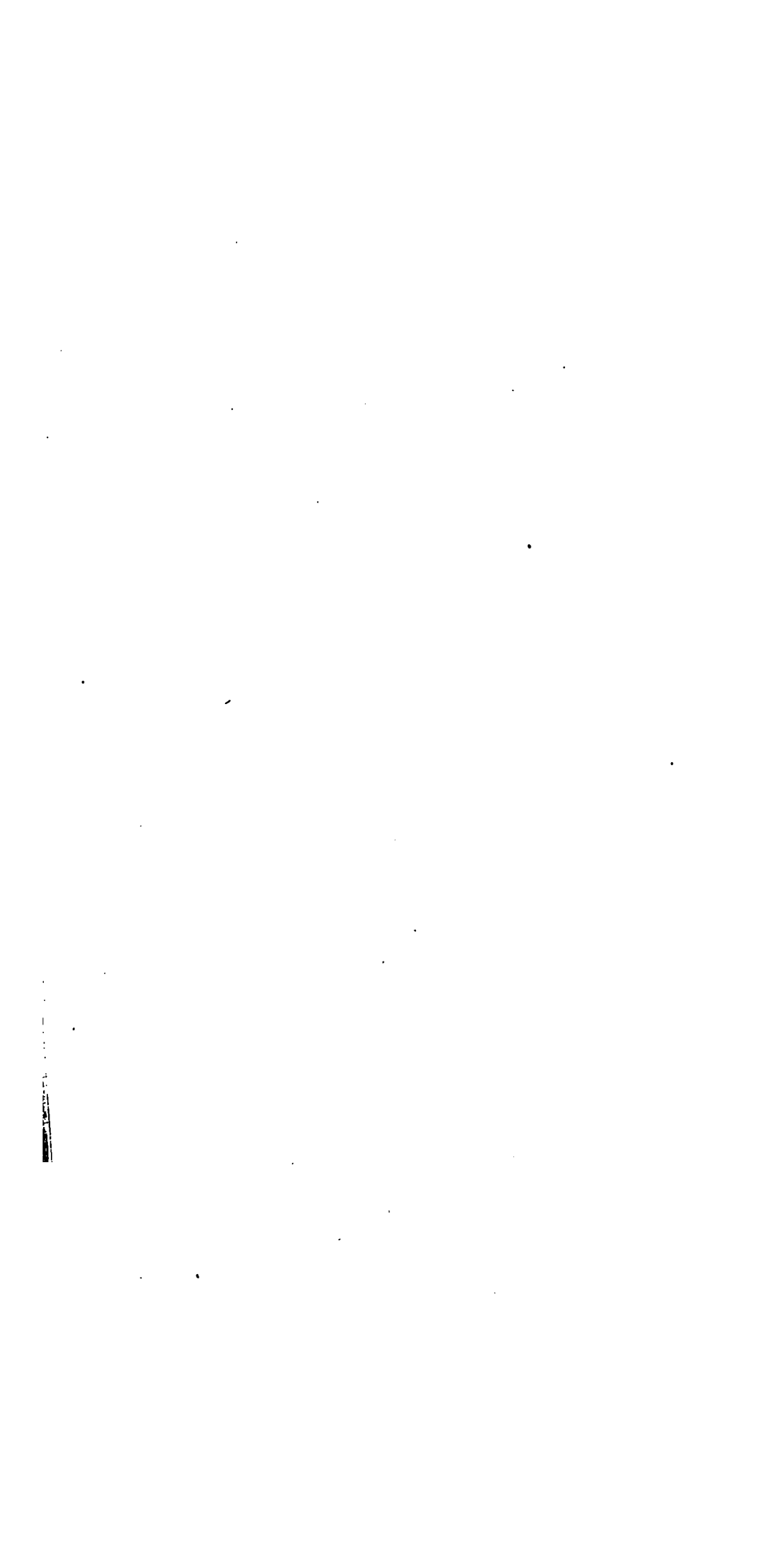




Fig. 1.

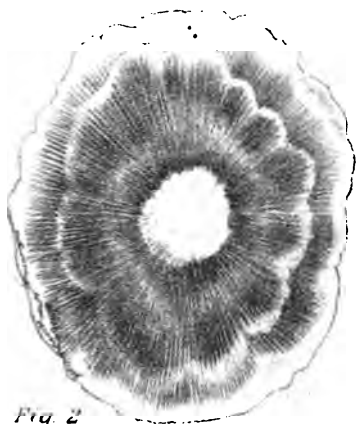


Fig. 2.

2a

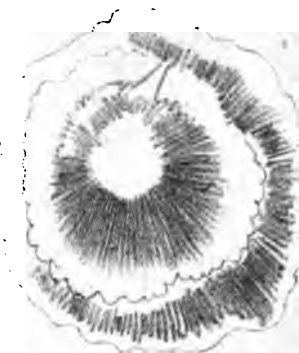


Fig. 3.

3a.



Fig. 4.

4a



Fig. 5.

5a.



the name *P. læstrigonum* is proposed for the species, to indicate its affinity with the mainland form.

These notes will be published in the Journal, Part II.

The following papers were read—

*Notes on the Dentition of Rhinoceros.*—By R. LYDEKKER, Esq., B. A.

*On the Extra-floral Nectar-Glands of Aphelandra tetragona*—By J. WOOD-MASON, Esq.

*On the Species of Choeradodis, a Genus of Mantodea common to India and Tropical America.*—By J. WOOD-MASON, Esq.

These three papers will be published in the Journal, Part II.

*Note by H. F. BLANFORD, Esq., F. G. S., A. R. S. M., &c., to accompany some drawings of large Hail-stones by COL. H. H. GODWIN-AUSTEN, and S. E. PEAL, Esq.*

The figures of large hail-stones which accompany this note (Plates II and III) were communicated to me at an interval of three years, by Col. Godwin-Austen and Mr. Peal, and are of interest as affording characteristic specimens of the form and structure most common in hail-stones of large size in India. The stones (Plate II), figured by Col. Godwin-Austen, fell at Calcutta on the 16th—17th March 1877, in a storm which was remarkable for the unusual lateness of the hour. It commenced a few minutes before midnight, and the hail continued to fall for about a quarter of an hour, accompanied, as is usual, by rain, and violent gusts of wind. In a paper by Dr. Buist, published in the British Association Report for 1855, the author quotes a remark of Dr. Spilsbury to the effect that of 60 storms recorded by him in India, only 3 occurred after dark and none later than midnight, and in my own experience, I do not recollect any previous instance of a hail-storm at so late an hour.\* The stones presented one somewhat unusual feature, *viz.*, radiating prominences of transparent ice, in some cases sub-angular and more or less conical, but in many instances cylindrical or club-shaped, some striking specimens of which form are represented in Col. Godwin-Austen's figures. It is probable that the rounded contours are due to the partial fusion of the ice; but I could not detect in any of the more angular prominences the characteristic hexagonal crystalline form of water. All the specimens figured, and those obtained by myself in this fall had a large nucleus of opaque ice surrounded by a thick transparent coating. Three of the stones figured are

\* Since the above was written I have experienced a hail storm at Simla at three o'clock in the morning. The above remark still holds good for the plains however.

larger than any observed by myself. Of those which I collected, five yielded on fusion, three fluid ounces of water.

The stones figured on Plate III from drawings by Mr. S. E. Peal, fell on the 11th April 1880, at 5 P. M. at Sapakattie in Upper Assam, and the drawings were accompanied by a few brief notes which I embody in the following remarks :

Two stones weighed 700 and 720 grains respectively and measured  $5\frac{1}{2}$  and 6 inches in circumference. Mr. Peal remarks that many were probably far larger. In form they varied from globular to egg-shaped and oblate. The surfaces were generally white and bluntly angular. Fig. 1 represents the external appearance of an ovate-stone. Figs. 2 to 5 the appearance of sections obtained by a man rubbing the hail-stone in his hands, and melting two sides only, until the mass was reduced to a thin lenticular disk. Fig. 2 represents the internal structure thus developed, the shaded parts being clear translucent ice with a radial structure, the white or whiter portions more or less opaque, when held up to the light. The majority, as in figs. 2, 3 and 4, had a dead white nucleus, surrounded by translucent ice, with, in all cases, radial markings. Some, like fig. 5, showed concentric lamination, consisting of white and translucent ice alternately in close concentric layers ; and between 20 and 30 per cent. had a transparent central nucleus about half an inch across. Mr. Peal further observes that the majority appeared to be light, as judged by their size, and they fell with less impetus than might have been expected. The wind was from the North at the time.

I have already remarked that these stones exhibit for the most part the form and structure most characteristic of such large hail-stones as have come under my observation in India. All that I have ever seen are more or less oblately spheroid or discoid, having sometimes a central depression on each of the flatter surfaces. Stones of a conical or conoidal form which appear to be not unfrequent in Europe, and which one recent writer has described as typical, I have never yet seen in India.

5. *Memorandum by H. RIVETT-CARNAC, ESQ., C. S., C. I. E., F. S. A., on Clay Discs, called "Spindle Whorls," and Votive Seals found at Sankisa, Behar ; and other Buddhist ruins in the North Western Provinces of India.*

The object of this paper is two-fold. It first describes minutely the objects named in the title ; afterwards it points out many points of resemblance between them and the objects discovered by Dr. Schliemann in his excavations at Hissarlik. For the latter purpose copious extracts are given from Dr. Schliemann's work on Troy.

Some conversation took place regarding the subject of this paper. The general opinion seemed to be, that it would be desirable to have some further information as to the authenticity of some of the objects, brought in by the villagers as "antiquities."

This paper will be published in the Journal, Part I, together with a Plate of discs and seals.

At the close of the meeting a collection of Sonthál, Bhootea, Gáro and Nágá weapons &c., sent by Mr. Robertson Pughe was exhibited. The collection was made up of the following articles.

*Sontháls.*

A. A Sonthál bow and arrows. In some of the arrows the pith of a plant is used instead of feathers. The arrow with a wooden head is used for knocking over small birds.

- B. Axes or "tangis."
- C. Flute.
- D. Cymbals.

*Bhooteas.*

E. Bhootea helmet, the owner of this was killed at the attack on Chamoorchee stockade, December 1864.

F. Bhootea shield (probably bought in our territory) and

G. Bhootea straight sword worn on the right hip. This was captured at Domohoni stockade, December 1864.

*Gáros.*

- H. Gáro shield with tuft of bear's hair.
- J. The universal Gáro sword.
- K. Gáro spears.
- L. Gáro pipe.

*Nágás.*

M. Nágá "dao," or sword, ornamented with goat's hair.

N. Nágá spear. At 40 yards the Nágás are dead shots with this weapon.

O. Lepcha knife.

P. A knife belonging to one of the Upper Assam Hill Tribes probably the Khamptis.

## LIBRARY.

The following additions have been made to the Library since the Meeting held in May last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,  
presented by the respective Societies and Editors.

Bombay. The Indian Antiquary,—Vol. IX, Part 106, May 1880.

*Branfill, Col. B. R.*—The Gangai-Koṇḍapuram Saiva Temple. *Richards, Rev. W. J.*—Notes on the Tanḍu Pulayans of Travankore. *Hoernle, Dr. A. F. R.*—Notes on a Rock-cut Inscription from Riwā. *Beal, Rev. S.*—Remarks on the word Sramana. *Fleet, J. F.*—Sanskrit and old Canarese Inscriptions, Nos. LXXVI to LXXIX.

Brussels. Société Royale des Sciences de Liège,—Mémoires, Vols. VII and VIII.

Vol. VII. *Koninck, L. G. de.*—Recherches sur les fossiles paléozoïques, de la Nouvelle-Galles du Sud (Australie).

Vol. VIII. *Eichhoff, W.*—Ratio, Descriptio, Emendatio Eorum Tomicinorum qui sunt in Dr. medic. Chapuisii et autoris ipsius Collectionibus.

Buda Pest. Hungarian Academy,—Almanach, 1879, 1880.

———. ———. E'rtkezések,—Vol. VII, Nos. 3—10; Vol. VIII, Nos. 1—4.

———. ———. E'rtésítője,—Parts 1—7, for 1878; and 1—6 for 1879.

———. ———. E'vkönyvei,—Vol. XVI, Nos. 2—5.

———. ———. Literarische Berichte,—Vol. II, Nos. 1—4; Vol. III, Nos. 1—4.

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*presented by the Author.*

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**PROCEEDINGS**  
**OF THE**  
**ASIATIC SOCIETY OF BENGAL,**  
**FOR JULY, 1880.**

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The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 7th of July, at 9.15 P. M.

H. B. MEDLICOTT, Esq., F. R. S., President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Superintendent Marine Survey Department,—A Chart of (1) Dabhol and entrance to Washishti river, (2) Kundari Island to Chaul, and (3) Saláya or Seraia.

2. From the Numismatic and Antiquarian Society of Philadelphia,—Some Monetary Questions viewed by the Light of Antiquity, by R. N. Toppan.

3. From the Editor,—Sanskrit Dictionary, by Hem Chandra, edited by Dr. Ram Das Sen.

4. From the President of the Anjuman-i-Panjab,—(1) Proceedings of the Anjuman-i-Panjab in connexion with the proposed bill for the appointment of persons to the office of Kázi, and (2) Report of the Oriental College, Lahore, for 1879.

5. From the Madras Government,—(1) Three Maps and twenty-three Photographs, and (2) Lists of Sanskrit MSS. in private Libraries of Southern India, Vol. I, by Dr. G. Oppert.

6. From the Department of the Interior, U. S. America,—(1) Tenth Annual Report of the United States Geological and Geographical Survey of the Territories for the year 1876, by F. V. Hayden, and (2) Catalogue of the Publications of the U. S. Geological and Geographical Survey of the Territories. Third edition.

7. From the Comptroller of the Currency, U. S. America,—Annual Report of the Comptroller of the Currency to the Second Session of the 46th Congress of the United States, December 1st, 1879.

8. From the Zoological Society of London,—List of the Vertebrated Animals now or lately living in the Gardens of the Zoological Society of London. First supplement, containing additions received in 1879.

9. From the author,—A comparative Grammar of the Gaudian Languages with special reference to Eastern Hindi, by Dr. A. F. R. Hoernle.

10. From the author,—Tenth Annual Report on the Health of Salford for 1877-78, with statistical abstracts for 1869-78, by Dr. J. Tatham.

The following Gentlemen, duly proposed and seconded at the last Meeting, were balloted for and elected Ordinary Members—

P. Johnston, Esq.

J. M. Coates, Esq., M. D. (re-election).

The Rev. Arthur Lewis, B. A.

The following Gentlemen are candidates for ballot at the next Meeting:—

1. Pandit Mohanlal Vishnupal Pandia, proposed by Dr. R. L. Mitra, seconded by A. Pedler, Esq.

2. The Hon. J. Gibbs, C. S. I., M. R. A. S., Simla, proposed by H. Rivett-Carnac, Esq., seconded by Dr. G. Thibaut.

3. Rajá Siva Prasad, C. S. I., Benares, proposed by H. Rivett-Carnac, Esq., seconded by Dr. G. Thibaut.

4. J. A. Brown, Esq., C. S., Benares, proposed by H. Rivett-Carnac, Esq., seconded by Dr. G. Thibaut.

5. W. Lambe, Esq., C. S., Jaunpur, proposed by H. Rivett-Carnac, Esq., seconded by Dr. G. Thibaut.

6. H. W. W. Reynolds, Esq., C. S., Jaunpur, proposed by H. Rivett-Carnac, Esq., seconded by Dr. G. Thibaut.

The SECRETARY reported that the Hon'ble J. S. White had intimated his desire to withdraw from the Society.

The PRESIDENT announced that, in accordance with the notice given at the May meeting, the votes would be taken on the proposed amendments to Rules 4 and 46.

Messrs. Waldie and Blackburn were appointed Scrutineers, and reported that the votes were one hundred and eleven for, and one against the amendments.

The PRESIDENT announced that the amendments were carried.

The SECRETARY laid upon the table the following publications of the Society which had been published since the meeting held in June last:—

(1) Journal, Vol. XLIX, Part I, No. 1, (2) Journal, Vol. XLIX, Part II,

No. 1, (3) Shaw's Turki Vocabulary which has been issued as an Extra No. of Part I of the Journal, and (4) Proceedings for April and May 1880.

Dr. A. F. R. HOERNLE read a Memorandum by Mr. H. Rivett-Carnac, supplementary to the one read at the last meeting, on Clay Discs, Spindle Whorls, &c.

This paper will be published with Mr. Carnac's first paper on the same subject in the Journal, Part I.

Dr. A. F. R. Hoernle exhibited four gold and four silver coins, Bactrian and South Indian, sent by Major-General G. G. Pearse.

GENERAL PEARSE writes—

I have the honor to forward for the inspection of the members of the Society a gold Rama Tunka coin which I have lately procured here. There are several of these coins in the Mysore country.

I trust it may be figured in our Journal, for if not now read, hereafter it may be so. Unless it has already been published and is no novelty.

I believe that the flat Rama Tunkas are the most modern ones, and that the cup-shaped ones are the oldest; these last I attribute to the age when cup-shaped coins were prevalent in Byzantium, *i. e.*, from the 10th to the 14th centuries A. D. The oldest Rama Tunkas, I believe, may be attributed to the Jain or Hoysálá Bállálá dynasty of Hullabeed or Dwara-vati or Dorasamudra in the present Mysore territory. This dynasty flourished from the beginning of the 10th century till A. D. 1310, when the Ghilzye Muhammadan General Kafúr from Delhi sacked the capital.

The Vijayanuggur dynasty arose after the fall of the Hoysálá Bállálás in A. D. 1336, it lasted till A. D. 1565 when it fell before a Muhammadan confederacy at the battle of Talikota, near Raichore, on the 25th January, 1565.

I attribute the later cup-shaped Rama Tunkas and all the flat ones to this great Vijayanuggur dynasty.

From the Vijayanuggur dynasty have indirectly sprung those of Mysore and other Southern Indian ones. This explains why remains of the Hoysálá Bállálá and Vijayanuggur dynasties are found in the Mysore territories.

The last king of Vijayanuggur was Rama Raja, he was killed at the battle of Talikota. Here, not knowing why, the people attribute this enclosed Rama Tunka to this prince. They may have reason.

The coin is of considerable interest, for, as will be seen in the annexed wood-cut, apparently characters of three different languages are figured on it, none of which seemingly can now be read here.





I describe the coin as follows :

Gold Rama Tunka, coin of Vijayanuggur.

Size, Mionnet's scale, nearly 10.

Weight 12·281 grams or 189·52 grains.

Age, Circa A. D. 1564.

*Obverse.* Rama and Seeta, seated on a throne, on the right a supporter upholds a royal umbrella; this is probably meant for Rama's ally Vibhishana the brother of Ravana. On the left, a lion and a monkey, this last probably meaning a Dravidian or a Rákshasa, are supporters. Above them may be letters or symbols? there is a star. Below them may be letters or symbols? There are an altar, a necklace and stars.

*Reverse.* Here there are eight figures all upholding various kinds of regal umbrellas of the peacock feather kind, such as are still in use in Southern India. These possibly depict the servants or followers of either Rama, or the king who struck the coin. Above these eight figures is decidedly an inscription, if looked at facingly, *i. e.*, in the usual way, it looks like Pehlevi: such I cannot conceive it to be. If the coin is turned upside down, the inscription looks like blundered Persian. Below the eight figures is what seems an inscription of a Javanese or Assamese type of Nagri.

The coin is in excellent preservation, every letter being perfectly legible.

Further I forward for the inspection of the members—three beautiful gold coins, all are I believe unique. They were found in the year 1878 in the river Oxus near Kúndúz in an old deserted Fort.

1. A stater *and a half*(?) of Diodotus, King of Bactria, with emblems of Antiochus.

2. A stater of Odgoras, a Scytho-Greek king.

3. A stater with Arian inscriptions of a Scythic king.

In a second communication relating to the same subject, General Pearse writes—

“In continuation of a late note of mine submitted when forwarding some gold coins, I have the honor to inform you that several more gold coins of the Oxus hoard are falling into my hands, amongst them that very rare coin, the Stater of Enthydemus. The specimen in my hands is in very good preservation and is of beautiful workmanship, but it has seen some circulation.

"The Staters of Antiochus and Diodotus are all new coins and in perfect preservation.

"I have another of those Stater and a half coins of Diodotus and Antiochus of which I have sent you one. I observe that like the one sent you, it is much worn, *i. e.*, used; this is very worthy of notice. The one I have with me is much more worn than the one with you."

Impressions of these coins were submitted to General Cunningham for his inspection, and his opinion of them will be gathered from the following remarks which he has sent to the Philological Secretary.

"I am sorry, for General Pearse's sake, to tell you that three of the gold coins of which you have sent me impressions are forgeries. The large *Rámatanka* is of course a genuine coin. Of two of his coins I possess the genuine originals from which the forgeries have been made.

"No. 1. Head of a king bearded, with victory in a 4-horsed chariot in the reverse, and the legend *OATOPOY*. I have already *seen* five of these forged coins. The forger luckily did not know Greek. My genuine coin has the beginning of the name cut off, as follows:

ANΔPAΓOPOY

"The forger took the remainder as the complete name, and made the impossible name of *OATOPOY*.

"No. 2. Head of Alexander with lion's scalp as Hercules. *Rev.* Victory—ΔΙ—. I have a genuine large double stater of these types; and as I know that forgeries have been made from it, I conclude from the evil company in which it is found, that General Pearse's coin must also be a forgery.

"No. 3. Head of Parthian king—Victory in chariot—with 2 inscriptions one on each side, not yet read. The original genuine coin is in the British Museum. I take General Pearse's coin to be a forgery from the impression which you have kindly sent me. In this I see that the horse is represented in *outline* which, as far as my experience goes, stamps the coin as a rank forgery.

"For several years past whenever a new coin has been found, it has always been followed by a number of forged copies. I pay large prices for the genuine coins—and so does the British Museum—and rare coins are not to be obtained now, except by chance, for even moderate prices."

118 Col. Berkeley—*Eleven gold Roman, Indo-Scythian, Gupta Coins.* [JULY,

Dr. A. F. R. Hoernle exhibited eleven gold coins, Roman, Indo-Scythian and Gupta, belonging to Colonel Berkeley, sent by Mr. H. Rivett-Carnac, C. S., C. I. E., &c.

Mr. Carnac writes the following note on these coins:—

“I send for the inspection of the Society eleven gold coins, which were discovered together with a quantity of gold mohurs by Col. Berkeley, Political Agent, in a subterranean Treasury at Rewah soon after the death of the late Maharajah.

“One of these coins is a Gupta. Eight of them are Indo-Scythic, the remaining two are Roman.

“I confess that at first some of the coins seemed to have been cast. And I supposed that they had perhaps been brought to Colonel Berkeley by Bombay traders. In this case they would have been very suspicious. But the manner in which they have been found, makes it I think, much less probable that they are forgeries.

“Some of them too have been used for necklaces and are much worn on one side.

“I should be much obliged if Dr. Rudolf Hoernle or Dr. Rájendralála Mitra will examine these coins and favour Colonel Berkeley and the Society with their opinions on them.

“If any of them are rare, Colonel Berkeley would I am sure be glad that they should be figured as well as described in the Society's Journal.”

Dr. Hoernle made the following remarks:—the Gupta coin is probably one of Chandra Gupta II; it has the legend श्री विक्रम *Śrī vikkrama* (with double *k*). The Indo-Scythian coins are of Kanerki and Hverki, all well known. Of the two Roman coins one is of the Emperor Commodus, of about A. D. 190, described in Akerman's *Roman Coins*, Vol. I, pp. 303, 307. The other is of Clodius, the short-lived rival of the Emperor Severus who perished in battle A. D. 197. The reverse of this coin shows a genius with radiated head, and the legend SAECVLO FRVGIFERO Cos. II. Akerman in his *Roman Coins* mentions no gold coin of this kind, but he does describe a *very rare* brass coin, agreeing with this coin in every respect (see Vol. I, p. 339); moreover he also describes a *very rare* gold coin, which agrees with the present coin in every respect, except that, on the reverse, it reads SAECVLIO instead of SAECVLO. Adding to this, that the present coin still bears distinct traces of its having been cast in a mould; there can be no doubt, that it is a forgery, a gold coin imitated from the rare brass coin. The other Roman coin and one or two of the Indo-Scythian ones also have a suspicious look, and having been found in company with an undoubtedly forged coin, their genuineness is questionable.

Dr. A. F. R. HOERNLE exhibited four coins of various sorts sent by Mr. V. A. Smith who writes the following note on them:



"I enclose a gold coin which I hope you will kindly identify for me. I believe it is one of the very rare Chandel coins but, after careful comparison of it with a gold coin of Madana Varmma and a copper one of Jaya Varmma (for which I am indebted to General Cunningham), I cannot make out the Rájá's name.

"I also submit some other coins in hopes that they may be of some interest.

"No. 2 is a curious looking old coin but so much damaged as hardly to be recognizable.

"No. 3, with its Greek legend *Μεγας βασιλευς* is, I suppose, Bactrian, but whether common or not, I do not know.

"No. 4 is much worn, and its outline has been destroyed, but a few legible characters may suffice to identify it.

"No. 5, is a fine silver coin of Sher Sháh's.

"Should this or any of these other coins be desired by the Society, they are at its disposal."

The coins were sent to Dr. Mitra for identification, and he recognizes them as—

No. 1. Gold. Old Hun Dinára. Carnatic.

No. 2. Varaha coin. श्रीमद्वाहिवाह.

No. 3. Soter Megas.

No. 4. Kota, Rao of 191 ? (the fourth figure is either 2 or 9) Samvat.

No. 5. Sher Sháh.

The PHILOLOGICAL SECRETARY, in Dr. Mitra's absence, exhibited a palm-leaf MS. of the *Setubandha*, 672 years old. Dr. Mitra has communicated the following note on this MS. :—

The codex comprises 86 folia, each measuring 14 × 2 inches. Its material is palm-leaf, having the edges rounded by the ravages of mice, and the centre perforated for a string to tie the leaves together. Each page bears five lines of writing in the Bengali character, interspersed with interlineations and marginal notes written in very minute but perfectly clear and well-formed letters. The language of the work is Prákrit, but the notes are in Sanskrit. Its subject is an epic poem on the invasion of the Island of Ceylon, by Ráma, as described in the *Rámáyana* of Válmíki. The work is ascribed to Pravarasena, of Káshmir, who reigned about the middle of the 4th century. It is held in high esteem by Sanskrit scholars, but MSS. of it are exceedingly rare. An excellent edition of it by the learned Professor Siegfried Goldschmidt, of Strassburg, has, however, lately made it easily accessible to students.

The name of the work is not always given in the same form. It is usually quoted under the name of *Setubandha*, or the "Marine Causeway," but in the colophon of Professor Goldschmidt's edition the homonym, *Setusarani*, has been preferred. It is also known under the names of

*Rávanavaho*, the "Destruction of Rávana," and *Daśamukhavaho*, "the Destruction of the ten-headed monster."

There are three commentaries extant on this work, the first two of which, by Rámadasa (*Setupradípa*) and Kṛishṇa (*Rámasetu-vivarāṇa*) respectively, have been noticed by Professor Goldschmidt. The third, by Kulanátha, is exceedingly rare, and of it the only MS. I have seen is now in my possession; it is entitled *Rávanabadha-ṭiká*. I intend shortly to send a copy of it to the learned editor. The fourth occurs in the Library of the Sanskrit College of Calcutta, and is entitled *Setuchandriká*. There is also in that Library a Sanskrit paraphrase of the work, but the codex is very defective, wanting both the beginning and the end, and I have not been able to ascertain its name.

The most important circumstance connected with the codex under notice is its date. This is given in Prákrit thus:

सिरि लक्ष्मणस्य चमदम सुवहरे राज्ञ वेविहर ।  
 पोसस्मि-छरनन्दसि सुपणे चदमस दिम्सहे ।  
 दोस्स-दिस्सामने सिद्धिनासौ वानीमायेनेति ॥

Two of the words in this extract are not intelligible to me; but the purport of the whole is clear enough;—it means that the MS. was completed by one Vánínátha, on Monday, the 16th of the waxing moon in the month of Pausha, (*lit.* when the sun sojourned in the constellation Pusya), of the year of the king Lakshmaṇa 102. The figures of the year are given in three words *dosa kha vissa* which *dosa* means the "arms" = 2; the second *kha* "sky" = a cypher; and the third *vissa*, the "universe" = 1. They have, according to the usual rule, to be read from the right side. I have elsewhere noticed that the era of Lakshmaṇa Sena begins from the year 1106, (Journal, Vol. XLVII, p. 399), and the date, therefore corresponds, with A. D. 1208. This gives to the codex an age of 672 years.

Of Nágari MSS. I have seen two or three works of an older date, but in the Bengali character this codex is the oldest that has come under my notice. It shows that seven hundred years ago, the Bengali letters were exactly of the same type as they were a hundred years ago, or until they were modified by the type-founders of Serampur at the close of the last century. The only peculiarities observable in the codex are—1st, the formation of the letter ञ, which is indicated by a dot in the centre of ञ; 2nd, the letter ञ, which is shaped like the Nágari letter; and 3rd, the फ़ which is formed by putting a horizontal line within ञ, thus फ़. This last form was current even at the beginning of this century. This shows that the present Bengali character, though formed on the model of the Nágari, has had a currency, distinct and independent without any change, for a period of seven hundred years, and looking to the uniform well-defined configuration of the letters in the MS. it would not be unreasonable to suppose that it had an independent existence for a considerable time before that period. It is impossible

to believe that the character came into currency ready-formed and fully developed in the time of Lakshmana Sena. Doubtless the Budál inscription of the Pála era, and the Sena copper-plates hitherto discovered, are in the Deva Nágari type of some kind or other, but not in the Bengali as it appears in the MS.; but that must be accounted for on the supposition, either that the Nágari was believed to be the most appropriate for Sanskrit records, or that for lapidary purposes the angular Nágari was preferred or better suited than the comparatively more cursive Bengali.

Looking to the unchanging currency of the Bengali character, for so long a period, the question may be asked, were the durations of the characters which had been current before it fully or nearly as protracted? The question is a most important one for the satisfactory settlement of dates from the forms of letters, and its solution is yet a desideratum. James Prinsep was the first to notice the subject in connexion with his researches into the dates of ancient inscriptions. He devised a system of palæographic chronology in which the style of the writing was taken as an index to the age of the document in which it was found. His plan was matured after a careful examination of a considerable number of ancient inscriptions and coins, and recorded in two tables, (Journal, Vol. VII, plates XIII and XIV,) in which different centuries were assigned each a particular set of characters. The materials available to him were, however, not large, and, doubtless, he took his tables to be merely tentative, subject to considerable corrections and modifications resulting from subsequent researches; for it is difficult to believe that he took each particular set of characters to belong to one particular century and no more, or assumed that the same character was common over all the Sanskrit regions for a given period. Change in the style of writing, like that in language, is a slow process, governed by a variety of causes, which tend to retard or accelerate its course, and, except in local and individual peculiarities, no marked divergence is perceptible until after periods which must, in the ordinary course of human progress and irrespective of extraordinary commotions or sudden changes in the material or instrument of writing, be reckoned by centuries, and not by years. Nor do the causes which produce the change operate with equal force every where, nor are the same causes in full operation in all places at any given time. Some of them are in some places more potent than in others, and various circumstances tend to accelerate or retard their action. Hence it is that we find that a particular style of writing, while predominating in some places, is dying out in others. The history of the German and the English characters in Europe affords a singular illustration of this fact.

The number of Indian inscriptions discovered since Prinsep's time is large, but little has as yet been done to systematize the information collect-

ed. The only work of importance published since Prinsep's days is Dr. Burnell's "Southern Indian Palæography;" but it has not contributed much to elucidate this phase of the question. In fact, our discoveries, though large, are not yet sufficiently varied and extensive to admit of a satisfactory solution as to how far styles of writing may be relied upon as guides to chronology. This has, however, not been borne in mind by many orientalists, and much mischief and considerable misunderstanding have thereby been caused in connexion with Indian dates. The practice of taking a dated inscription as a guide, and assuming all undated records written in its character to be of that date is becoming too common. Some renowned antiquarians have adopted this course of proceeding, and I must frankly confess, to my regret, I have myself sometimes followed their lead. It is, however, not the less reprehensible on that account. It leads to the same error, which would have resulted if the MS. under notice had not been a dated one, and I had, comparing it with a dated MS. of the 17th century which I have now before me, pronounced it to be of that age; and this is exactly the kind of mistake which has of late been committed repeatedly in connexion with what Prinsep called the Cave and the Gupta characters; and, in the hands of persons who do not themselves read inscriptions, the names become the veriest Will-o-the-wisps. With them every inscription in the Gupta type must be of the 6th century, because some one has discovered a dated record in that character. The Bádámí inscriptions for instance. Others, taking the Manadeva inscription, dated Samvat 886 = A. D. 329 (*Indian Antiquary*, IX, p. 163), or the Jayavarmá inscription of A. D. 356. (Samvat 413) or the Vasantasena record of A. D. 378, (Samvat 435) as their guide, may put down the Gupta to the 4th century, and pronounce all records in that character to be of that age. This can only lead to the confusion, and not to the elucidation, of Indian history. Lately I had occasion to protest against an attempt to determine the changes in the Páli character within the short periods of twenty and thirty years (*ante*, p. 9) and what I said then fully applies to the cases of the Gupta and the other types. Nowhere have I seen any attempt made to ascertain the extent of difference which arises from the difference in the grain of the stones on which inscriptions have been inscribed.

It is the farthest from my wish to urge that, because, on the authority of the MS. now submitted, I hold that the Bengali character has now had a currency of seven or eight centuries without any material change, the leading groups of the Kuṭila, the Gupta, the Cave, and the Páli characters must each have had as prolonged a currency. I would say nothing of the kind, for as yet we have not data sufficient to determine that question; but I am convinced that the practice of assigning each of them to one or two centuries is a mistaken and mischievous one, and should be guarded against.

The PRESIDENT then exhibited a specimen of Rock-salt forwarded to the Society by Dr. Aitchison, and made the following remarks on the subject :

In continuation of the collection of rocks noticed in our Proceedings for January, we have received from Dr. J. E. Tierny Aitchison, botanist to the Kuram field-force, "a piece of black or gray coloured rock salt that was collected near the village of Páre-Angúri in Chakmani territory, about 20 miles from Kuram Fort." The specimen was given to him by Mr. Christie, the Political Officer, and there is no mention of the conditions of its occurrence. It may be presumed that the Political officer made a note of whether the mineral was worked, and to what extent, but the information has not been communicated. On the maps the Chakmani country lies at some distance to the west of the fort, and south of the Kuram river. The blackness is only superficial, and is apparently due to the accumulation, in the process of melting, of the particles that give a grey tinge to the salt. This impurity consists of very fine sandy calcareous earth blackened by a small proportion of carbon, but the salt seems to be excellent, and fit for ordinary use as it is. Seeing that on the border of these hills, in Kohát and the Salt-Range, there are two enormous deposits of rock-salt, the latter overlaid by palæozoic rocks and the former overlaid by tertiary strata, there is ample room for conjecture as to the geological position of the Chakmani deposit. There is, however, some ground for surprise at its occurrence there at all, at least if in any quantity, in the fact of the very large trade in salt from Kohát to beyond the Frontier. In the published official account of that trade, a copy of which I have placed on the table, it is represented that Kábul itself is largely supplied with Kohát salt, and that the principal route for the traffic lies up the Kuram valley.

Mr. J. WOOD-MASON exhibited some Butterflies from the Andamans collected by Mr. A. de Roepstorff.

The NATURAL HISTORY SECRETARY also exhibited some butterflies sent from Mussoorie, N. W. Himalayas, by Mr. Cecil Templeton. These butterflies consisted of—

A specimen of the female of *Limenitis Danava*, which sex is rarely seen in collections.

A female of *Neptis zaida*, which it is believed has never before been seen.

Two fine specimens of a large species of *Neptis* probably new to science.

The Natural History Secretary also exhibited a new species of butterfly belonging to the family *Morphidæ* from Sibsagar collected by Mr. S. E. Peal.

The name of this new butterfly is *Æmona Peali* closely allied to *Æ. Amathusia*, but differing therefrom in the arched instead of sinuous-concave outer margin of the forewing, and in other points which will be found fully



described in the paper to be published with coloured illustrations in the Journal.

The following papers were read—

1. *Essay on the Súryaprajñápti*.—By DR. G. THIBAUT, *Principal, Benares College*.

(Abstract.)

The *Súryaprajñápti* is a well-known work on the cosmological and astronomical system of the Jains. But until recently our knowledge of that system was very limited, and founded only on the usual references made to the Jain doctrines by orthodox Hindú writers on Astronomy. The system was principally known as containing the peculiarly strange doctrine of the existence of two suns, two moons and a double set of constellations. In 1878 Prof. A. Weber published a short summary of the *Súryaprajñápti*, from which it appeared that the Jain system was not so fantastical as it might have been expected and, at all events, was intimately related to the ordinary system prevalent all over India, before it came under the influence of Greek science. The object of the present Essay is, to submit the *Súryaprajñápti* to a renewed, detailed investigation, in order to accurately establish the points of agreement as well as those of difference between the astronomical system of the Jains and the others generally accepted in India.

This paper will be published in the Journal, Part I.

2. *First List of Diurnal Lepidoptera inhabiting the Andamans based upon a collection made during the months of May and June, by MR. A. DE ROEPSTORFF*.—By J. WOOD-MASON, and L. DE NICEVILLE.

This paper will be printed in the Journal, Part II.



## LIBRARY.

The following additions have been made to the Library since the Meeting held in June last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,  
presented by the respective Societies and Editors.

Berlin. K. preussische Akademie der Wissenschaften,—Monatsbericht, July 1879, January and February 1880.

July, 1879. *Pringsheim*.—Ueber Lichtwirkung und Chlorophyll-Function in der Pflanze. *Virchow*.—Beobachtungen des Hrn. J. M. Hildebrandt auf Madagascar. *Olshausen*.—Ueber die Umgestaltung einiger semitischer Ortsnamen bei den Griechen. *Vogel, H. W.*—Ueber die Spectra des Wasserstoffs, Quecksilbers und Stickstoffs. *Kaupert*.—Ueber die Einwirkung des Phosphorpentachlorids auf Senföle und verwandte Körper. Ueber die Methylpyrogallussäure und über die Bildung des Pittakalls. Ueber die volumetrische Aequivalenz von Sauerstoff und Chlor. *Schröder*.—Das Kāthakam und die Mātrāyaṇī Samhitā. *Sybel*.—Zwei Lehrer Friedrich Wilhelms III in der Philosophie. *Martens*.—Uebersicht der von Hrn. Peters von 1843 bis 1847 in Mossambique gesammelten Mollusca. *Galle, und V. Lasaulz*.—Bericht über den Meteorsteinfall bei Gnadenfrei am 17 Mai 1879.

January, 1880. *Siemens*.—Ueber die Abhängigkeit der Elektrischen Leitungsfähigkeit der Kohle von der Temperatur. *Hofmann*.—Ueber die Einwirkung des Schwefels auf Phenylbenzamid. *Peters*.—Mittheilung über die von Hrn. Dr. F. Hilgendorf in Japan gesammelten Chiropteren. *Weber*.—Ueber zwei Parteischriften zu Gunsten der Maga, resp. Çākadvīpiya Brāhmaṇa. *V. Lingenthal*.—Mittheilung über eine Handschrift. *Goldstein*.—Ueber die Entladung der Elektrizität in verdünnten Gasen. Ueber elektrische Lichterscheinungen in Gasen.

February, 1880. *Kronecker*.—Ueber die Irreductibilität von Gleichungen. *Peters*. Ueber eine neue Art der Nagergattung *Anomalurus* von Zanzibar. *Oppolzer, Th. von*.—Ueber die Sonnenfinsterniss des Schuking. *Bernstein*.—Ueber den zeitlichen Verlauf der elektrotonischen Ströme des Nerven. *Vogel, H. W.*—Ueber die neuen Wasserstofflinien, die Spectra der weissen Fixsterne und die Dissociation des Calciums. *Quincke*.—Ueber elektrische Ausdehnung. *Hildebrandt*.—Die Berginsel Nosi-Kómbo und das Flussgebiet des Semberáno auf Madagascar. *Peters*.—Mittheilung über neue oder weniger bekannte Amphibien des Berliner Zoologischen Museums. *Rammelsberg*.—Ueber molekulare Erscheinungen am Zinn und Zink.

Bombay. The Indian Antiquary,—Vol. IX, Parts 97 and 98, June and July 1880.

June. *Beal, Rev. S.*—The Sūtra called Ngan-shih-Niu, i. e., Silver-White Woman. Succession of Buddhist Patriarchs. *Walhouse, M. J.*—Archaeological Notes. *Bhagvánál Indrajī*.—The Saiva Parikramā. *Sandford, W.*—Account of Excavations made near Manikyala, in the Panjab. *Jacobi, Dr. H.*—

On Mahāvīra and his Predecessors. *Bhagvānīdī Indrājī*, and *Bühler, Dr. G.*—Inscriptions from Nepal.

Bordeaux. Société de Géographie Commerciale,—Bulletin, Nos. 10 and 11.

Boston. Society of Natural History,—Memoirs, Vol. III, Part 1, Nos. 1 and 2.

No. 1. *Minot, C. S.*—On *Distomum Crassicolle*: with brief notes on Huxley's proposed classification of worms.

No. 2. *Scudder, S. H.*—The Early Types of Insects: or the origin and sequence of insect life in palæozoic times.

———. ———. Proceedings,—Vol. XIX, Parts 3 and 4; Vol. XX, Part 1.

Part 3. *Scudder, S. H.*—An Insect Wing of Extreme Simplicity from the Coal Formation. *Morse, E. S.*—Remarks on *Lingula*, and Japanese Pottery. *Scudder, S. H.*—*Rachura*, a new Genus of Fossil Crustacea.

Part 4. *Scudder, S. H.*—Note on Dimorphism in Acrydians. *Wilder, Prof. B. G.*—Aëreal Respiration in the Mud Fish. An apparatus to illustrate the action of the Diaphragm in Respiration.

No. 1. *Hagen, Dr. H. A.*—Museum Pests observed in Cambridge. Larvæ of Insects discharged through the Urethra. *Parker, A. T.*—Experiments on Spontaneous Generation.

Calcutta. Geological Survey of India,—Memoirs, Vol. XV, Part 2.

*Griesbach.*—Geology of the Ramkola and Tatapani Coal-Fields.

———. ———. Palæontologia Indica,—Series X, Indian Tertiary and Post-Tertiary Vertebrata, Vol. I, Parts 4 and 5.

Part 4. *Lydekker, R.*—Supplement to Crania of Ruminants.

Part 5. *Lydekker, R.*—Sivalik and Narbada Proboscidea.

Series XIII. Salt Range Fossils: by Dr. W. Waagen.

1. Productus-Limestone Fossils. 2. Pisces—Cephalopoda: Supplement. Gasteropoda.

———. Mahābhārata,—No. 47.

Genoa. Museo Civico di Storia Naturale,—Annali, Vols. IX—XIV.

Vol. IX. *Pavesi, J.*—Studi anatomici sopra alcuni uccelli. *Thorell, T.*—Descrizione di alcune specie di Opilioni dell' Arcipelago Malese appartenenti al Museo Civico di Genova. *Sharp, D.*—Description of a new species, indicating a new genus, of Coleoptera. *Chapuis, F.*—Cryptocéphalides inédits du Musée Civique de Gênes. *Gestro, R.*—Aliquot Buprestidarum novarum diagnoses. Descrizione di una nuova specie del genere curis, della famiglia dei Buprestidi.

Vol. X. *Harold, E. de.*—Énumération des Lamellicornes Coprophages rapportés de l' Archipel Malais, de la Nouvelle Guinée et de l' Australie boréale par M. M. J. Doria, O. Beccari, et L. M. D'Albertis. *Thorell, T.*—Studi sui ragni malesi e papuani. I. Ragni di Selebes raccolti nel 1874 dal Dott. O. Beccari. *Gestro, R.*—Descrizioni di alcuni Coleotteri e diagnosi di quattro specie nuove esistenti nel Museo Civico di Genova.

Vol. XI. Crociera del Violante comandato dal Capitano-Armatore Enrico d' Albertis durante l'anno 1876.

Vol. XII. *Rondani, O.*—Hippoboscita exotica non vel minus cognita. *Pavesi, P.*—Seconda contribuzione alla Morfologia e sistematica dei Selachi. *Dubro-*

- ny, A.*—Essai sur le genre *Chelidura*. *Bellonci, G.*—Morfologia del sistema nervoso centrale della *Squilla mantis*. *Issel, A.*—Appunti paleontologici.—III Ritrovamento del genere *Machaerodus* sugli Appennini Liguri.
- Vol. XIV. *Issel, A.*—Appunti paleontologici. IV. Descrizione di due denti d'Elefante, raccolti nella Liguria occidentale. *Salvadori, T.*—Catalogo di una collezione di uccelli fatta nella parte occidentale di Sumatra dal Prof. Odoardo Beccari. *Dubrony, A.*—E'numération des Orthoptères rapportés par M. M. J. Doria, O. Beccari, et L. M. d' Albertis des régions Indienne et Austro-Malaise. *Vinciguerra, D.*—Appunti ittologici sulle collezioni del Museo Civico di Genova. I. Enumerazione d'alcune specie di pesci raccolti in Sumatra dal Dott. O. Beccari nell'anno 1878 *Oberthur, R.*—Notes sur quelques Coléoptères récoltés aux îles Sanghir par les chasseurs de M. A. A. Bruijn et description de trois espèces nouvelles.
- London. Academy,—Nos. 420—422.
- Anthropological Institute,—Journal, Vol. IX, No. 3, February 1880.
- Keane, A. H.*—On the Relations of the Indo-Chinese and Inter-Oceanic Races and Languages. *Fule, Col.*—Notes on Analogies of Manners between the Indo-Chinese Races and the Races of the Indian Archipelago. *Westropp, H. M.*—Notes on Fetichism.
- Royal Astronomical Society,—Monthly Notices, Vol. XL, No. 5, March 1880.
- Hall, Prof. A.*—Observations of the Satellites of Mars. *Gledhill, J.*—Phenomena of Jupiter's Satellites, observed at Mr. E. Crossley's Observatory, Barmerside, Halifax.
- Athenæum,—Nos. 2743—2746.
- Royal Geographical Society,—Proceedings, Vol. II, Nos. 4 and 5, April and May 1880.
- No. 4. Progress of the East African Expedition; Mr. Thomson's Report on his Journey from Lake Nyassa to Lake Tanganyika. *Bildulph, Major-Gen. Sir M. A.*—Pishin and the Routes between India and Candahar.
- No. 5. *Temple, Lieut. G. T.*—Voyage on the Coasts of Norway and Lapland. *Hutchinson, E.*—Ascent of the River Binué in August 1879; with remarks on the systems of the Shary and Binué. *Thomson, J.*—Progress of the Society's East African Expedition: Journey along the Western side of Lake Tanganyika.
- Royal Microscopical Society,—Journal, Vol. III, No. 2, April 1880.
- Nachet, A.*—On a Petrographical Microscope. Record of Current Researches relating to Invertebrata, Cryptogamia, Microscopy, &c.
- Nature,—Vol. XXII, Nos. 551—554.
- No. 552. *Flower, Prof.*—Comparative Anatomy of Man. II. *Stewart, Prof. Balfour.*—On Systematic Sun spot Periodicity. Primitive Man.
- No. 553. *Flower, Prof.*—Comparative Anatomy of Man. III. *Crookes, W.*—Contributions to Molecular Physics in High Vacua. *Geikie, Prof.*—Rock-Weathering.

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No. 49. *Pâris.*—Les Extincteurs. *Huxley, Prof. Th.*—Organes des sens et fonctions de reproduction de l'écrivisse. *Dastre.*—Vie et travaux de Glisson d'après M. Marion. *Legoyt.*—Statistique du suicide.

No. 50. *Moutier, J.*—La loi de Dulong et Petit. *Tollin, H.*—Michel Servet.

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- GOLDSTÜCKER, PROF.** Literary Remains of the late. 2 Vols. 8vo., London, 1879.
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- REGNAUD, P.** Le Chariot de Terre cuite (Mricchakatika), drame Sanscrit attribué au roi Cūdraka, traduit et annoté des scolies inédites de Lallā Dikshita. 4 Vols. 12mo., Paris, 1876-77.
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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
FOR AUGUST, 1880.

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The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 4th August, at 9.15 p. m.

H. B. MEDLICOTT, Esq., F. R. S., in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the authors,—(1) Valuations of coins which are now, or have recently been current, by Col. J. F. Tennant, (2) The Indian Swastika and its Western Counterparts, by E. Thomas, (3) Results of Meteorological Observations, 1879, at G. V. Juggarow's Observatory, Daba Gardens, Vizagapatam, by A. V. Nursingrow, and (4) Lyttoniana, Vol. I, by Adhar-l Sen.

2. From the Batavian Observatory,—Rainfall in the East Indian Archipelago, first year, 1879, by Dr. P. A. Bergsma.

3. From P. W. Sheaffer, Esq.,—Diagram of the Progress of the Anthracite Coal Trade of Pennsylvania, with statistical tables &c.

4. From the Government of the Netherlands,—Bôrô-Boudour dans le de Java, by F. C. Wilsen and J. F. G. Brumund.

5. From the Bengal Secretariat,—The Flora of British India, Vol. II by Sir J. D. Hooker.

6. From the Marine Survey Department—Chart of Port Mouat in North Andaman Island.

The following Gentlemen, duly proposed and seconded at the last Meeting, were balloted for and elected Ordinary Members—

Pandit Mohunlall Vishnulall Pandia.

The Hon. J. Gibbs, C. S. I.

Raja Siva Prasad, C. S. I.

J. A. Brown, Esq., C. S.

W. Lambe, Esq., C. S.

H. W. W. Reynolds, Esq., C. S.



The following Gentlemen are candidates for election, and will be balloted for at the next meeting of the Council.

1. Richardson Walter Nicholson, Esq., Ghazipur, proposed by H. Rivett-Carnac, Esq., seconded by Alex. Pedler, Esq.

2. Lieut.-Col. M. G. Clerk, Benares, proposed by H. Rivett-Carnac, Esq., seconded by Alex. Pedler, Esq.

3. Babu Benod Behary Mullick, proposed by Babu Protapa Chundra Ghosha, seconded by Dr. R. L. Mitra.

4. Babu Sib Chunder Nag, Personal Assistant to the Commissioner of Chittagong, proposed by Babu Adharlal Sen, seconded by Babu Umesh Chunder Dutt.

5. Khalif M. Hussan, proposed by Moulvie Kabiruddin Ahmad, seconded by Alex. Pedler, Esq.

The PRESIDENT announced that, in accordance with Rules 37 and 38 of the Society's Bye-Laws, the names of the following Gentlemen had been posted up, as Defaulting Members, since the last Monthly General Meeting, and would now be removed from the List of Members, and published in the Proceedings.

J. F. Baness, Esq.

W. Porter, Esq.

P. Dejoux, Esq.

J. S. Gunn, Esq., M. B.

The COUNCIL announced that Dr. T. R. Lewis had tendered his resignation as Member of the Council and Trustee of the Indian Museum, and that Mr. H. F. Blanford had been re-elected Member of Council.

The SECRETARY announced that H. E. the Viceroy LORD RIPON had consented to accept the office of Patron of the Society.

Dr. A. F. RUDOLF HOERNLE exhibited some photographs of groups of Aryans and non-Aryans from the so-called "neutral zone" on the North Western frontiers of India, sent by Dr. G. W. Leitner, Principal of the Government College at Lahore. The photographs were taken at Lahore, and represent men from Hanza, Nagyr, Chitral, Gilgit, Kolab, Gabrial and Badakhshan.

Dr. RAJENDRALALA MITRA exhibited a facsimile of a Chinese inscription forwarded to him by Mr. Barton, Magistrate and Collector of Gayá. The stone which bore the record was found by Mr. Beglar in one of the rubbish mounds around the great temple at Buddha-Gayá at a depth

[illegible]



।। नमो नमो वायव्य ॥ सकनी नमो निग्या ग ॥ शुवतु रं विवा सुव ॥  
कु वं कमता कतुः सविह्वल वं ॥ उ आह अतस्त्रो मना  
युग्यग विषः । नमो वल प्रलप कुचल युत नी विवि ॥ उ यव य ह  
कवन न न श्रीया य यो न कौडि रालिः । स ग प्रज्ञा  
कय ह गाला कृ प ह नि यतः ॥ उ प्रा न कृ थ ग ह वि यं ॥ नि ब्र ॥  
नृ व ग न वा द्धि शो अर ग हृ ह वै ह क ना य ग य ते यः ॥ नि ब्र ॥  
नमो उ व नै ग्ग नं ह्यु वा न वि न य मृ ह त्रिः । नमो वि  
नर गः प्र या न कौडि र व ना व र ॥ उ श्वा र क ह नि श्व बा क ना धी ना वि  
नृ वी र द्ध म ना थ प्र ॥ । आ प्रा न वृ ह प्र लि म्प णि र्गो द्वि ॥ प्र ला ड  
वद व द व ॥ ग्ले र्द्वी विः प्र क ण डि वा ने वा ह्म म्म व डे न्म डु वं द्वि हे न्म  
गन्तु । आ ग ह प्र मृ नु गान ह्य म्म ना नि श्व र कृ ना प्र पि ना नि डु म् ॥ प्रा क्रि  
य (अ न्म हं ग ण ड ह हृ मि या ना नि श्व र कृ नि ॥ नि ड प्र नो ज क्र म  
नृ व श प्र नि तो ष ह्वि ता व मृ ह । वि पा पा वि ड मृ नि ॥ नि ड प्र नो ज क्र म  
हृ ता ड्धि य डि नृ य व न प्र न म्म र्म प्र वा ड ता ड्धि र्म नि ड प्र वि म्म  
क्रि र्म वी वि म नो र क र ॥ प्र म्म नि र्म र्म नि ड प्र म्म नि ता ड्धि वि म्म ॥  
प्र ड्धि क र ॥ ग ह ड्धि र्म नि र्म नि र्म नि ता ड्धि र्म नि ता ड्धि वि म्म ॥







of about 12 feet from the top of the mound. It had evidently been set up by a Chinese pilgrim, very much in the same way in which the Burmese inscriptions have found their way to the place. Dr. Mitra had sought the aid of some Chinamen of Cossitollah to decypher the monument, but had failed, the interpretation given him being of a character which could not be verified by him. He had been told that the record was a thousand years old. If so, it would be of the time of Hiouen Tshang; but it may be older still, and may be the identical stone which Fa Hian is said to have set up at Buddha-Gayá. Dr. Mitra intends to send the facsimile to the Rev. S. Beal, London, to be decyphered.

Dr. MITRA also submitted the following notes on two copper-plate inscriptions found in Sylhet and forwarded to him by Mr. Luttman-Johnson.

I am indebted to Mr Luttman-Johnson, Deputy Commissioner of Sylhet, for facsimiles, in duplicate, of two copper-plate grants, which had been discovered several years ago, but lately brought to notice by Paṇḍit Śrīnīvāsa Śāstrī, brother of the renowned Sanskrit scholar and poet, Ramā Bāī. Bābu Rājanārāyaṇa Deva Chaudhuri, in whose estate they were discovered, says "they were found about 15 years ago, in a tillah in Bhāṭārā, and dug up from a depth of about 8 feet, in the course of removing old bricks from the foundation of an ancient building." The tillah stands by the highway, at a distance of a mile to the south-west of a market called Bhāṭārā bazar, and close by a hill also named Bhāṭārā. Some call it Naolar tillah, others, Iṭer tillah (brick mound). According to tradition the tillah is the palace which belonged to Rāja Gauragovinda *alias* Govinda Siṅha. He was a prince of great renown, and much devoted to Vedic rites. A tillah at a short distance is shown in the centre of which he used to perform the homa rite, in a large square vat lined with bricks. This is called Homer Tillah. Close by, there is a place which bears the name of Dakṣiṇā Kāṇḍa, and this is said to be the place where he distributed alms, after performing the rite. A large tank in the neighbourhood is also attributed to him. The prince was overthrown by Shāh Jellāl, *alias* Jelāl-uddīn Khāny, who, following the footsteps of his predecessor Mulk Yuzbek, led his army to the eastern parts of Bengal, invaded Sylhet in 1257 A. D., and brought some of the petty independent rājās under his control. His success, however, was short-lived, for he was suddenly called back to defend Gaur from the invasion of Irsilān Khān, and soon after killed in battle. Bābu Jagachchandra Deva Chaudhuri gives the following details of the discovery: "When in 1279 (B. S.) one of my tenants, named Shaikh Kātāi, was engaged in digging out bricks from this tillah, he found two copper-plates with letters engraved on them. These were taken by my brother Kāśichandra Rai Chaudhuri (now deceased), and



were with us for years together, until about two years ago Maulavi Hámid Bakht Majumdár took them from me. The Maulavi made them over to the Deputy Commissioner in whose office they are now preserved."

Each grant is inscribed on two quadrangular plates of copper, having a projection, on the top of which a hole was intended to be bored, but this was not done. One set is much larger than the other, the former measuring  $12\frac{1}{2} \times 11$  inches, and the latter  $8 \times 6\frac{1}{2}$  inches.

The larger set has 27 lines of inscription on the first plate and 28 on the second. The small one 16 lines on each plate. The letters on the two are of the same type, a cross between the Kuṭila and the Bengali, and, on the whole, in a fair state of preservation.

No. I opens with a salutation to Śiva, and then gives a genealogy of four kings who are said to have belonged to the race of the moon. The founder of the line was Navagirváṇa, in whose favour the panygerist has nothing to say beyond his having been the issue of prosperity personified. His son Gokula Deva claims distinction for being the grandfather of the reigning king. His son was Náráyaṇa, and from him descended Govinda *alias* Keśava, who granted, for the adoration of a lingam of the name of Vāteśvara, whose temple stood in Haṭṭapátaka (the great fair), probably the Bhátará bazar of the present day, lands to the extent of 375 plough measures, 296 houses, and a great number of slaves. One of the epithets used for Śiva is *Srihaṭṭeśvara*, or the lord of Sylhet.

The lands and houses given were scattered in different villages, and their names as also the extent of land in each village, are given in detail, but from want of local knowledge I am not in a position to identify them.

The most remarkable peculiarity in the record is the use of the word *hala* "a plough" for indicating a measure of land. I do not remember to have noticed it in any other land-grant that I have seen. In old Smritis it is, however, often referred to. Thus in Manu, (VII, 119), "Let the lord of ten towns enjoy the produce of two plough-lands; the lord of twenty, that of ten plough-lands; the lord of a hundred, that of a village or small town; the lord of a thousand, that of a large town." The word used is *kula*, which in ordinary Sanskrit means a herd, but the commentator Kulluka Bhaṭṭa explains the term by the words "as much ground as can be tilled with two ploughs each drawn by six bullocks."\*

This technical meaning is recognized by Hárīta, who says, "the *hala* (plough) drawn by eight bullocks is the most virtuous, (*dharma-hala*, i. e., the best); that of six bullocks belongs to men of consequence; that of four for ordinary householders; and that of two for Bráhmaṇicides (for whom bare subsistence is all that is needed)."

\* तथाविधचलद्वयेन यावती भूमिर्वाह्यते तत् कुलमिति वदति ।

† अष्टानवर्गं चर्माचलं यद्गवं जीवितायिनां ।

चतुर्गवं श्वपशूनां द्विगवं ब्रह्मघातिनाम् ॥

In the Smṛiti of Parásara the verse occurs with slight variations, changing "householders" into wicked men, and "Bráhmanicides" into tauricides.\*

I have failed to find out the exact area of the land the term indicated. But looking to the original meaning of the word *kula* I am disposed to think that it is closely related to the Anglo-Saxon *hyde* and its Latin congener *hida* or *hyda*, with its various corruptions in most of the modern languages of Europe. It originally meant *as much land as could be tilled with one plough*, and was thus equal to a *kula* of Manu and a *hala* of Háríta, though subsequently it came to mean a *family possession*, and has been differently estimated by different authors from 60 to 120 acres. Hume has a passage quoted from Spelman, which reads very like a paraphrase of Manu's verse, it runs thus: "Four hydes made one knight's fee, the relief of a barony was twelve times greater than that of a knight's fee," (*History of England*, II, p. 116.) I have nowhere seen any attempt made to account for the use of the word hyde meaning *cutis*, to indicate a plough; I fancy it is a metonymy for a bullock which stands for a plough. This idea, however, had been long ago forgotten, for even in the Greek story of Dido, when she asked for a hide of land, she was understood to mean as much land as could be covered by a hide, and she cut up the hide into thongs to cover a large area to found the city of Byrsa: no idea of a plough or bullock was then entertained. It may be conjectured that a bag made of an entire hide was naturally a hide, and as much land as could be cultivated by seed contained in that bag was also called a hide; but there is no proof of any kind to support it, and it must therefore be rejected as unwarrantable. Anyhow there is sufficient similitude between *hala* and *hide* to suggest the idea of a common origin.

The date of the record has been read by Paṇḍit Śrīnivāsa Śāstrī, to be the year 2928 of the era of the first Paṇḍava king: पाण्डवकुलादिपाळाब्द सं २९२८. But in the original the first figure is very unlike the third, and has been moreover scratched over, and is abundantly doubtful. The second is also open to question. I am disposed to take the first for a 4, and the second for 3, which would make the date equal 4328 = A. D. 1245, or about the time when Sháh Jellál invaded Sylhet. That the Govinda of the Tillah is the same with that of the record I have no reason to doubt.

No. II is a Vaishṇavite record. It opens with a salutation to Nárāyaṇa, the husband of Kamalá; and gives a list of four kings, who belonged to the lunar race. The first was Gokula, who is said to have been as munificent as the *kalpa* tree. His son was Nárāyaṇa, who was followed by

\* अस्मद्वृत्तं चर्मा वृत्तं मध्यं कृतं ।

चतुर्वर्गं चर्मा दिग्वं वृत्तानिनाम् ॥

Keśava Deva, who dedicated a temple to the destroyer of Kañśa, and performed the rite of weighing himself against gold, silver and other articles which he presented to Bráhmans. His son was Íśána Deva. He erected a lofty temple for the enemy of Madhukaitabha, a form of Vishnu, and, by the advice of his minister Vanamálí Kara, a Vaidya by caste, and the concurrence of his commander-in-chief Viradatta, presented two ploughs of land for its support. The deed was engraved by one Mádhava of the Dása tribe, on the 1st of Vaiśákha in the year 17. The word used for the year is ८०, which is an abbreviation of Samvat, a word ordinarily used for the era of Vikramáditya, but not unoften also for any era, and here it is obviously intended for the era of the king's reign.

It is obvious that the first prince of this plate is the same with the second of the first plate, the next two are likewise the same, for there is no reason to doubt that Keśava of the second plate is the *alias* of the Govinda of the first grant, and the new name Íśána Deva, is the fifth from Navagírvána. The genealogy will accordingly stand thus—

1. Navagírvána *alias* Kharavána.
2. Gokula.
3. Náráyana.
4. Keśava *alias* Govinda.
5. Íśána.

These rájás were sovereigns of Káchár, and professed to be of the dynasty of Ghaṭotkacha, son of Bhíma, one of the Páṇḍu brothers, by Hidimbá, the daughter of an aboriginal cannibal chief. It is extremely doubtful, however, if the Páṇḍus ever came so far to the East.

If the date assigned to the first plate be accepted, the second will be a little over 17 years after it, or in the last quarter of the 13th century.

#### *Translation of Inscription, No. I.*

Om ! Salutation to S'iva. Salutation be unto him, who is the lord of the three worlds, by whose body, represented by the earth,\* is this universe upheld, who is known as the supreme lord, and as one who, though verily one alone, has the threefold names of Brahmá, Upendra, (Vishnu) and Mahéśa, and as the receptacle of the three qualities, the leader of creation.

2. He prospers—he the crown-jewel on the head of the destroyer of Tripura, the silver pitcher for the bath of the mistress of Cupid, the whetstone for sharpening the arrows of the flowery-bowed god, the cool-rayed ornament of night.†

\* The body of S'iva is described to represent the earth, water &c., in eight forms. सर्वाय क्षितिभूर्भवे नमः &c.

† Epithets for the moon.

3. In his race were born many valorous kings whose eulogiums are tant on the land of Bharata.

4. Now was born the noblest of kings Navagírvána,\* (the new god,) fierce arrow, (*kharavána*) of great renown, the issue of the goddess of royal prosperity.

5. His son, the king of the name of Gokula Deva, was the grandfather of the (reigning) king. It is wonderful that the sunlight of his glory used numbness in inimical kings (instead of exciting vivacity as sunlight would).

6. From him descended king Náráyana, who, like Lakshmí, was turned from the ocean of antagonistic kings, with the Mandára mountain valiant arms, and who rivalled the Lord by taking his shelter in enjoyment (nanda).†

7. Of him was born Keśava Deva of unmeasured hymn of merit and glory, whose feet were decorated with the jewels of royal crowns, who was the ornament of earthly sovereigns, the destroyer of rival kings, even as Govinda‡ himself.

8. He prospers—he the ultimatum of wonderful manliness, the mode of fame, the asylum of beauty, the dwelling place of all kinds of earning, the shelter of justice—he the centre of all light, the source of variety, the home of enjoyment, the jewel of all speech, the store-house of goodness, the personification of all good qualities.

9. He, having by his arms protected the land of dependant kings, became the protector of the good,§ and revived the festivity of the destroyer of Kañśa. This Keśava Deva (*alias* Govinda), who had whirled his scus at his enemies, has, through his anger, brought to an end all the children of the race of his antagonists; (or who has destroyed the Śísupála his enemies).||

\* The words Navagírvána and Kharavána are so placed that either of them may stand for a proper name, or both may be epithets. I take at random the first for the proper name. The second may be an *alias*.

† There is a *double entendre* here in the word Nanda. Even as Lord Kṛishṇa took shelter with Nanda, the cowherd, so did he betake to nanda (pleasure).

‡ The god Kṛishṇa. The two words Keśava and Govinda have been so introduced that both may stand for proper names, one in illustration of the other. Probably both were the names of the same person, and the poet has availed himself of the fact to play upon the name.

§ *Sadorindavana*. There is a play upon this word which once means the town *indavana* near Mathurá where Kṛishṇa dwelt in his childhood, and once the good people—*sat* good, and *vrinda* collection.

|| Śísupála, king of Chedi, was an enemy of Kṛishṇa, and killed by him in a single combat. The word means a number of children—*śíśu* "child" and *pála* "a herd."

10. He has, by the vigour of his arms, brought this earth under one royal umbrella, wishing not to allow the existence of any foreign possession.

11. He has appointed his hands to replace the Kalpa tree, his valour to replace the sun, his fame to serve the purposes of the moon, and his arms to supply the place of Ananta (in upholding the earth). His eyes alone have the courage to override his ears (*i. e.*, his eyes were so long that they extended as far as the ears; or that his virtuous course—the course founded on the observance of Vedic rules—none dared to disturb).

12. Having effected the gratification of all well-disposed people, having, by the play of his sword, subjugated all sides, and having cast far away all other kings, this king governs as the chief of eastern kings (or greater than all former kings).

13. His well-earned white glory, bright as the moon, has made the earth white; it has blighted the bud of the inimical lotus; it has blown the lily of enjoyment. Is it giving delight by moving on constantly, or by remaining fixed? Is it the result of any cause, or is it eternal? It is wonderful.

14. The unrivalled fire of the king's vigour flourishes. How wonderful it is? It becomes manifest by the vapour of inimical kings, (though vapour is no characteristic sign of fire); it is not blown out by the tears of enemies (though ordinary fires are extinguished by water); it causes torpidity in hostile potentates, (while ordinary fires dispel torpidity). It has enveloped the quarters of the earth (even as ordinary fires envelope wood; play upon the word *kāshṭha*, which means both wood and quarters). It licks the sky (even as the flame of a large fire does).

15. That king, engaged in battle, caused two prominent things to be bent low by his two qualities, (*guṇa* strings)—by one string his bow, by the other, perceivable by the great, the host of his enemies.

16. By the glory of that king, bright as the rays of the laughing moon, and of illimitable might, the whole earth has been overpowered—glory that has leaped across many oceans.

17. Now, Bhagavān Vāṭeśvara, of form without a beginning, the source of the earth, the lord of the three worlds, unwilling to abide in Kailāsa, descended on earth and dwelt at Haṭṭapāṭaka.

18. That king, whose feet are emblazoned by the crest-jewels of kings, and who is the noblest of all kings, presented to that crescent-crested divinity, in different villages,

19. Lands to the extent of 375 plough measures and 296 houses.

20. He, the devotee of Śiva, gave to Śiva, the lord of S'rihaṭṭa, many slaves and men of various races. In Chāṭāpaḍādeva 35 ploughs, and houses 110. In Baḍagrāma, ploughs 13. In Mahavāpura, plough 1. In Haḍhī-

thánaka, ploughs 7, houses 6. In the north of Degigáñ, plough 1. In Navapanchana, ploughs 5, house (?). In Ayatanika, ploughs 7. In Siḍḍava, house 1. In Amanáta Bhavika, ploughs 6 (?) In Guḍhavayika, houses 3. In Kátáváchha, ploughs 3. In Koṇárka (some epithets unintelligible), house 1. In the town of Yitháyi, ploughs 17, houses 4. In Nenrivatága, houses 3. In Oḍhátithárka, ploughs 3, houses 11. In Kaiváma, ploughs ?, house 1. In Bálusigráma, ploughs 5. On the west of Navachha, ploughs 5, houses . In Athinabátika, ploughs 5, houses 8. To the south of Kadhaḍhiyá, to the east of Gosyayá, to the north of Gováta, to the west of Babani, ploughs, 18. To the south of the river Savagá, ploughs 5, houses 3. To the north of that river, ploughs 35, houses 13. To the north of that river and the east of Vátisasta, house 1. To the north of that river, west of Ghaṭibhú, and south of Sarvabhú, ploughs 7. To the north of the river Kániyáni and the east of Yegamyaganiyá, ploughs 8½, houses 7. To the south of the river, the east of Thabasonti and the west of Bháskaratenkuri, ploughs 15, houses . In the two villages of Náṭayána within Jagáyá, ploughs 5, houses 30. In Saná-gayaḍáka, to the east of Amikáthi, and the west of Ságara (sea?), ploughs 10. To the south and north of Kániyáni river, ploughs 8½. To the south of the Nágáyi river, ploughs 6, houses 10. In Bhogáḍhaopáda, to the north of Báḍhaḍha (a hollow), ploughs 9, houses 9. To the west of Tathogásana and the north of Haṭṭavava, ploughs 7, houses 10. In Baḍasochasa, to the south of Satakopá, ploughs 10. In Chedgambuḍika, ploughs 3, house 1. In Aḍanakáthi, houses 8 \* \* \* \*. In Nadyánika, ploughs 8 house 1. In Bhúka, to the east of Upamsivo and the north of Athávi, ploughs 80, houses 13. In the village of Naḍakuṭi, houses 8. In that village to the north of the river Thága, houses 6. In Bhúka, to the east of Gosvepapota, to the north of the cattle-path, to the south of Háḍi Ganga (tank) to the west of Dhanukundoḍhi, ploughs 5. In Pochháníyá, ploughs 10. In Devagásana, ploughs 5. In—to the north Jopábasuyá, house 1. In Bhátaghada 10, also house 1. In Badagopagadá, 1. Also there—house for—7.

In Bhátapadá——(unintelligible) house 1,——house 1,——houses 5. Also in Nidova—cooking houses 5. In Nido—cooking houses 3. In Bhátapadá—houses for cooking—3. In the town of Piápi houses for—3. In the village of Sihádava—cattle-shed 1 (a line unintelligible) are given. By Sagara and many other kings land has been given; to whomsoever the land belongs for the time being to him belongs the reward (of such gifts). Whoever resumes land, whether given by himself or by others, becoming a worm in ordure, rots therein along with his ancestors. In the era of the first king of the Pándava race 4328.



- १७। दिमचीपाखदीक्षया चौशीम् । मुतिपञ्चलङ्कनसाक्षसमासीत् कान्नाहशमेव ॥ अयं  
सुहृच्चक्र-
- १८। मुदं विभावयन् प्रसाधिताशः करवाकलीलया । सुदूरमुत्थारितराजमण्डलो रराज  
पूर्वावमिष्टम्-
- १९। शिरोमणिः ॥ करोति चवत्तं जगत् विनयतेऽरिपद्मोन्नमं तनोति कुमुदं यशः सहस्र-  
मस्य च-
- २०। श्लोकम् । सितं किमथ रत्नकं धमदनारतं किं स्थिरं सकारणमिदं सत् किमिव  
नित्यमित्यङ्गु-
- २१। तम् ॥ बाष्पैश्चोपतीनां यदयमनुमितोऽमूर्च्छितो यन्निपूणां कीलाक्षैर्यतनोति  
द्विषद्वनिभुजां-
- २२। आचमर्चिर्वितानैः । काष्ठानां यद्वातीत्य प्रकरमुपययावन्मरं लेखिहानक्षेनाचर्यक्-  
शीमा जयति नर-
- २३। पतेः कोपि तेजःलभानुः ॥ चौशीभुजा यमपदाक्षवसङ्गतेन तेनोन्नतद्वयमनामि  
मुह्ययेन रक्ते-
- २४। न कार्मुकमसीमसहः प्रकर्षगम्येन वैरिनिवहः सहसापरेह ॥ महीभुजाजीयत चन्द्र-  
हासकरेह ते-
- २५। नाभितविक्रमेह । विलङ्घितानेकपयोधिनेयं स्नेनैव छत्वा यशसा धरिनी ॥ अथा-  
स्त्रि कैलासनि-
- २६। वासनिप्युहः क्षतावतारो भुवि चङ्कपाटके । अनादिरूपो जगदादिरप्ययं त्रिलोकना-  
थो भग-
- २७। बान् वटेचर ॥ भगिश्चेष्टाय तस्यै चपश्चेष्टारत्नविस्तुरचरः । प्रददौ नाना-  
घामे निखिलचप-
- २८। घामहीरेवः ॥ अधिकं पक्षसप्तत्या भूचलानां भतवर्ध । भतद्वयव वाडीनां पक्षवत्या  
समन्वितं ॥ नाना-
- २९। परिजनांलक्ष्यै जगज्जातीरनेकशः । प्रादात् श्रीचङ्कनाथाय शिवाय शिवकीर्तनः ॥  
चाटापङ्कादेवसवे भूह-
- ३०। ल २५ ॥ वाटी ११० वङ्कगामे भूचल १२ मङ्कवापुरे वाटी १ चढीचामाके भूचल ७  
वाटी ६ देगिगामोत्तरे भूचल १ नव-
- ३१। पक्षने चल ५ वाटी + आचयतनीके चल ७ शिङ्कडे वाटी १ अमनाडे भविके भूचल-  
६ गुङ्गावयीके वाटी २ काटा वाङ्-
- ३२। ते भूचल २ आचानिलते जनीघनाकोणाके वाटी १ यिद्याधिनमरे भूचल १७ वाटी  
४ नेचवतागे वाटी २ थोङ्गाति-
- ३३। चार्के-छतकवभूचल २ वाटी ११ कैवामे चला(?) वाटी १ बालूसीगामे चल ५ नव.  
बादी-यस्थिमे चल + + + भूचल ५ वा-



- १४ । डी अथिनचाडीके भूचल ५ वाटी ८ कडडिया दक्षिणे मोस्रया पूर्वे मोवडोतरे वववी-  
पश्चिमे-
- १५ । भूचल १८ सबगानयी (दी) दक्षिणे भूचल ५ वाटी १ तथा नद्युतरे भूचल १५ वाटी  
११ तथा नद्युतरे वाटी-
- १६ । सप्त पूर्वे वाटी १ तथा नद्युतरे वटीभूपश्चिमे मर्वभूदक्षिणे भूचल ७ कानियानी  
नद्युतरे येगम्यगच्छि-
- १७ । या पूर्वे भूचल ८ ॥ वाटी ७ तथा नदीदक्षिणे ववसोनीपूर्वे भास्तरटेकुरीपश्चिम  
भूचल १५ वाटी +
- १८ । जगयात्तरे नाटयानभामद्वये भूचल ५ वाटी १० सनामयङ्काके अनीकाधीपूर्वे सान-  
रपश्चिमे भू-
- १९ । चल १० कानियानीनदीदक्षिणात्तरे भूचल ८ ॥ नागायि नदीदक्षिणे भूचल १  
वाटी १० भोगाडतवाड-
- ४० । डोतरे भूचल ९ वाटी ९ तथोगासन पश्चिमे चडववोत्तरे भूचल ७ वाटी १० सातको-  
पादक्षिणे वडसोच-
- ४१ । स भूचल १० चेङ्गम्बुकीके भूचल १ वाटी १ आडाककाथीके वाटी ८ भूके + न + न-  
द्यानीके वाटी ८ मे + पवा-
- ४२ । कवाटी १ भूकेउपस्थितो पूर्वे आथावी उत्तरे भूचल ८० वाटी ११ नडकुडीगामे वाटी  
८ तथागामे यागन-
- ४३ । दुत्तरे वाटी १ भूके + मोखेपपोतपूर्वे गोपथ + तरे चडीगाडदक्षिणे वनकुखोडी  
पश्चिमे कवगा-
- ४४ । समचल ५ पोखानिया अथानि उताक भूचल १० + च देवगासन पूर्वे भूचल ५  
वो वाडडा दक्षि-
- ४५ । ये जोगावनिया उत्तरे वाटी १ भाटपडाके केदाकादिवावगूड १० तथा केतीचताका-  
दि गोपगूड
- ४६ । तथा व + पाकादि ते चडड तथाकेकास्य नोविन्दाय्ट १ वडुगामे गोपमहा १  
तथा के आवपा-
- ४७ । नाकादिवावगूड ७ डोगाडतावानि निमावगूय । ते गूड भाटपडाचडाथाना । न +  
उगडाकानि गूड
- ४८ । भाट पडाववपथ । तक्षपथाननि विवाकवाकादिसाना गूड भाटपडा निमेवाका-  
दि गो गूड भाट
- ४९ । पडानिजापित गोनिनु । य्ट १ वजकसिवम्याय्ट १ वोवातुथानि वंवाथाडाधि  
पाकायि य्ट ५
- ५० । तथा । निडे + वे + + कादि य्ट ५ नवभाड । निडे X भाट पाकादि य्ट १  
भाट पडा निवापपाका-

- ॥१॥ दि चङ्छिपय्य १ पिप्पापि मन्त्रे चोन्ने नविका + दि म्भ १ सिद्धाडवपामे दन्तक-  
निवज्जवि मो म्भ १  
॥२॥ कोदी ऊरुको महासाळडो कोदी-सळ्ळ कोदीनो छतां वूडोभां चविषडोदपण  
आसिर न पिच्छा  
॥३॥ आपिथाचे भाल + उ दय आकादयः प्रदत्ताः ॥ वज्रनिर्वृत्तुषा दत्ता राजभिः सम-  
रादिभिर्यस्य यस्य  
॥४॥ यदा भूमिस्तस्य तस्य तदा फलं ॥ खदत्तां परदत्तां वा यो हरेत् वसुध्वां स विद्यायां  
छभिर्भूना पि-  
॥५॥ छभिः सच पथते ॥ पाण्डवकुलादिपालाब्द ४१२८ ।

*Translation of No. II.*

Salutation to Náráyana. May Kamalákánta (the husband of Kamalá), blue as the precious sapphire, (or) as the lightning-streaked cloud, and arrayed in charming golden drapery, protect you !

2. The lord of nectariferous beam\* prevails—he the lion that destroys the herd of elephants formed of lofty and even more lofty masses of darkness,—he the crest-jewel of Mahádeva.

3. In his race was born the crest of the earth. By his birth the noble deeds (of his race) became radiant. He was the all-giving tree (Kalpa tree) to the desires of all who bore arms: he was Gokula, the protector of the earth.

4. His son, the noblest among wielders of arms, the Mandára 'mountain in the great ocean of arms, by beauty and loveliness made most charming in appearance, was Náráyana.

5. He was the receptacle of all arts, the home of all merit, the assemblage of valour, the substratum of civility, the ocean of gentlemanliness. He was of prominent beauty, and of renowned deeds, the crest-jewel of the universe.

6. Unto him was born as son Késava Deva, the lord of mighty vigour, the oppressor of enemies, a hero like Govinda,† great as the lord of trees, (Kalpa tree,) whose feet were adorned with the crest-jewels of kings.

7. By his merits, delightful to hear, were attracted hosts of learned Bráhmans, who, having got all their desires gratified, thought not again of their own native places.

8. When he ruled the earth kings never slept even at night, always thinking what precious wealth they should present to him.

9. He, the great king, master of an army of innumerable war-boats, infantry, cavalry, and lines of rutting elephants, made the earth glorious by his fame, white as Kunda flowers.

\* The moon. † This may be the proper name and Késava Deva the epithet.

10. He, the mighty, presented to the destroyer of Kañśa, a lofty stone temple, the discus on whose towering crest so cut up the clouds of heaven that they fell in showers of rain.

11. By (his performance of) the rite of Tulápurusha\* the Bráhmaṇs got so much wealth that they were covered with golden jewels, and became like unto the all-giving tree of desire, (Kalpa tree).

12. From him descended, even as Ráhuleya (Kártika) from Mahéśa, (Śiva), or the victor light from the son of Rohiṇí (the moon), Iśánadeva, of glorious deeds, the moon among kings.

13. When his mighty army of infantry, cavalry and elephants issued forth, on victory intent, the dust raised on earth eclipsed the glory of the sun.

14. When his war-boats plied on the aqueous highway, the water was so splashed in masses that it soothed his chariot horses, fatigued by the oppressive rays of the sun.

15. That glorious king built, for the enemy of Madhukaiṭabha, a mansion which licked the clouds, and the flags flowing on its towering crests looked like flowers on aerial trees.

16. Under this lord of the earth there was an able minister† of the name of Vanamáli Kara, a brilliant light in the race of Vaidyas.

17, 18. By his advice this patent (*sáśana*) for two ploughs of land with its dwelling land and corn-fields was issued by the king. It should be upheld by the kindly disposed, by the childless eldest prince, as also by the virtuous wife of the dead prince and his infant son.

19. This was suggested by the commander-in-chief Viradatta, the noble lord of battles, the valiant, and the patient, whose fame had spread to the limits of the quarters of the earth.

20. Whoever resumes land, whether given by himself or another, rots as a worm in ordure along with his ancestors.

21. This eulogium was composed by the learned Mádhava, the noblest of the Dása tribe: may it last unchanged as long as the ocean, the hills and the earth remain in existence. 1 Vaisakha, Samvat 17.

### Transcript of Inscription No. II.

- १। ॐ नमो नारायणाय ॥ सद्गानीश्वरसिंहासः सुवर्णवहिराम्बरः पा-  
 २। तु वः कसलाकान्तः सविद्युदिव वारिदः ॥ तुङ्गेतुङ्गतमः सोमनाभ-  
 ३। युयुधताधिपः । मैत्रिरत्नं सद्देशस्य जयत्यस्तदीधितिः ॥ तदम्बयेभू-  
 ४। दुवनावतंसः स्त्रीयोदये प्रोक्त्यलकीर्तिराशिः । समस्तलक्षणं नृपसंसाधे-

\* A rite in which a donor weighs himself severally against gold, silver, rice &c., and presents those articles to Bráhmaṇs.

† *Paṭṭanika* equal to the *Paṭṇáik* of Orissa and *Paṭṭanáyaka* of other inscriptions.

- ५। कल्पद्रुमो गोकुलभूमिपालः ॥ तस्यात्मजः ब्रह्मन्तं विप्रिष्टः सम्भ्रान्तमन्त्रा-  
 ६। र्चनमन्दराद्रिः । त्रिया हृदा सङ्गतमङ्गुलीर्भूव नारायणदेव एवः ॥ निधिः क-  
 ७। लानां भवनं मुहानां शैव्यस्य रात्रिर्विनयस्य भूमिः । मौजान्यपायोनिधिव-  
 ८। द्रतत्रीः प्रख्यातकीर्तिर्भुवनावतंसः ॥ तस्योदतेजा रिपुराजशेषी गोवि-  
 ९। ंदवीरो द्रुमनाथसंज्ञः । आपालचूडामणिमण्डिताङ्गः पुत्रोऽभवत् केश-  
 १०। वदेवदेवः ॥ गुह्यैर्हृदीयैः श्रवणाभिरामैराह्वयमाणा गुणिनस्त-  
 ११। मन्त्रात् । आगत्य सम्यग्भक्तमनोरथाश्च न सख्यवर्ज्यभुवं द्विजेन्द्राः ॥  
 १२। यस्मिन् मर्षो प्रासति भूमिपाला निद्रां रजन्वासपि नाधिजग्युः । सखि-  
 १३। न्ययः परितोषहेतोरास्य विनाशयितुं वरुनि ॥ निःसीमनैवाटकप-  
 १४। तिवाजिप्रभिन्नदन्तावलम्बेन्यसम्पत् । स राजराजः कुमुदावदानैर्यशो-  
 १५। भिरञ्जीं विमलीचकार ॥ स मन्दिरं कंसनिहृदयस्य शिलाभिरुच्चैर्विदधे  
 १६। मञ्जोः । यगङ्गशृङ्गस्थितचक्रधाराचताः चरन्तान् घना दिवस्थाः ॥  
 १७। तुलापुष्पदानस्य सम्प्राप्य द्रविणमिदृजाः । कल्पद्रुमा इवाभवन् हेमात्-  
 १८। हारभूषिताः । तस्यान्तर्भादिव बाहुलेयः पीयूषरश्मेरिव रौहिणेयः ।  
 १९। श्रीमानभूभिर्भक्तकीर्तिराशिर्रीशानदेवः क्षितिपालचन्द्रः ॥ यज्जैवयाचाप्र-  
 २०। चक्षतपदानितुरङ्गदन्तावलम्बेन्यकीर्णः । रज्ज्वाभिरुच्यः परिमृष्टमाश्रय-  
 २१। शोकाङ्गाः सज्जमिमीलदकैः ॥ यदीयनैवाटककेलिपातघातोऽखलद्वारिभिर-  
 २२। यरश्मैः । रथैस्तुरङ्गैरभिसन्तपद्भिः सन्नाहशान्तिः सुतरामखलि ॥ विनि-  
 २३। र्जमसौ मधुकैटभारेः प्रासादमर्धलिङ्गमूर्जितश्रीः । यगङ्गशृङ्गप्रचलत्पताका-  
 २४। मखरोर्मश्चरिक्वेव भाति ॥ एतस्य शयिनीभर्तुराजपट्टनिकः कृती । वैद्यवं-  
 २५। शप्रदीपः श्रीवज्रमालिकरोभवत् ॥ अस्य विज्ञापनाङ्गुपः प्रासवं कृतवानयम् । राजपु-  
 २६। त्रो यः खविरः पुत्रशृङ्खलः ॥ पाण्डुभूषणद्वयं सशस्त्रास्य वेद्युतं  
 २७। मृतस्य राजपुत्रस्य पत्नी या कुलपालिका । शिशुश्च तनयः तस्याः पाण्डुमेव तयो-  
 २८। रपि ॥ आदेशिकोभूत् समरप्रवीरः श्रीवीरदत्तः शतनाथिनाथः । दिग-  
 २९। न्तर्ज्ज्वालयप्रभस्त्रिः प्रतापवानूर्जितधैर्यराशिः ॥ खदन्तां परदन्तां वा यो  
 ३०। चरेत् वसुधरां । स विद्यायां कृमिभूला पिष्टभिः सद्यः पच्यते ॥ एतां प्रशस्तिं विदधे वि  
 ३१। वेकी श्रीमाधवो दासकुलावतंसः । यावत् समुद्रा गिरयश्च यावज्जीवात् क्षितौ ताव-  
 दिदं ब्रूयन् ॥ सं १७ वैशाखदिने १

The following papers were read—

1. *On the Calcutta Water-supplies, past and present.*—By A. PEDLER, F. C. S., F. I. C., &c.

(Abstract.)

This paper was divided into three parts. The first was devoted to the consideration of the quantity and quality of the old supply which ex-

isted before the introduction of the present hydrant water. In speaking of the old supply it was assumed to be to a great extent confined to the various tanks and shallow wells distributed throughout the town, for though there is no doubt that the river water was used considerably by the inhabitants who lived near the river, yet the greater number of the inhabitants, living as they did at a distance from the river, must have depended for their supply of household water on the tanks and wells nearest to them. As to the quantity of the old supply, even if it be assumed that it was possible to store up the water which fell in the rainy season for use during the dry months of the year, and granting that one-fifth of the rainfall found its way into the tanks and shallow wells, then each inhabitant of the town could not have had more than 6 or 7 gallons of fresh water daily, and an inhabitant of some parts of the northern division could not have had more than 3 or 4 gallons. The conclusion seems to be inevitable, that, at the time when Calcutta depended for its water supply on its tanks and wells, the inhabitants must have used the same water over and over again, though of course without knowing it.

The state of affairs as to quality was even worse than as to quantity, and the analyses which have been made show at the very lowest estimate that, of the 200 samples of Calcutta tank and well waters examined, forty-four per cent. were true sewages, twenty-two per cent. were dilute sewages, twenty per cent. of the waters were contaminated with considerable quantities of sewage, nine per cent. were "dirty waters," and about four or five per cent. only were moderately safe waters. These last consisted principally of the well kept tanks on the maidan, and two or three others in the southern part of the town. A detailed examination of the results also showed that the tanks and wells of the northern divisions are much more impure, than those of the southern sections of the town.

The second part of the paper dealt with the present water supply of Calcutta which consists of the Hooghly water pumped from the river at Pultah, where it is collected in settling tanks, and after subsidence it is filtered through sand and supplied to Calcutta.

It appears that the total daily supply of filtered and unfiltered water in Calcutta for the past year was 8,556,025 gallons, equivalent to 19.92 gallons per head of population, or practically there were 20 gallons of water available for domestic and sanitary purposes for each inhabitant. This though perhaps not an abundant supply is a fairly liberal one, and is very much larger in quantity than the old supply from tanks and wells. It is, however, not equal to the quantity allowed in most European towns, for the average daily water supply of English towns is about 25 gallons per head of population. In this country, however, it would appear that a more liberal supply would be required than in a European climate, and it is

therefore proposed to double the present supply of filtered water, in which case Calcutta would receive a daily supply of 16,000,000 gallons, equivalent to 37·2 gallons per head. If this proposal is carried out, the supply of filtered water will be most abundant, and it will be amply sufficient for every possible want of the town so long as it keeps to its present dimensions.

From the analyses of the hydrant water, it appears that the Calcutta water falls just outside the class of waters of "great organic purity," but that it is well within the class of waters of "fair organic purity."

On comparing the hydrant water with the average composition of *unpolluted* upland surface water as given by Dr. Frankland, it is found that it is scarcely so pure as unpolluted water should be, and it must therefore be admitted that the Hooghly water has been slightly contaminated before it reaches Pultah. The amount of contamination is, however, not very great and, as pointed out before, the Calcutta water falls well within the class of waters of medium purity. That the Calcutta water must be contaminated to a certain extent must be obvious to any one who is acquainted with the customs of the inhabitants of India, and more particularly of the inhabitants of villages and towns on the banks of the rivers. This contamination is a drawback to the complete safety of the water supply, for a water once contaminated is always more or less dangerous as a water supply. It does not, however, at present appear to be possible to cut off these sources of contamination, and the hydrant water though good is not a perfect supply.

The third part of this paper was devoted to the consideration of the extension of the present water supply. It has been proposed to collect the water from the river within 3 or 4 miles of Calcutta, but it is shown by the analytical numbers that water collected from these places would be decidedly impure, and a strong opinion is expressed that the water for the extension of the supply should be collected at Pultah as has been hitherto done.

Dr. Mitra remarked that the paper read would prove valuable to the Municipal Commissioners of Calcutta, who were engaged in considering a project for the doubling of the water-supply of the town, and hoped that it would be published early. He was glad to notice that great emphasis was laid on the inadequacy of the present supply, and on the necessity of increasing it largely. He did not, however, entirely agree with Mr. Pedler in the conclusions he had come to with regard to the extent of the water-supply in former times. There was never any want of water; there was enough and to spare. The sources of the supply were not limited to tanks and wells, as stated in the paper: the river yielded the largest supply. All along the western side of the town, the people depended mainly on the

river ; they bathed there, and drew their supply for domestic consumption entirely from it, limiting the well-water available in their homes to washing of floors and courtyards, and other coarse purposes. People in the centre and the eastern parts also drew their supply of drinking water from the same source. There was a great number of people who earned their living by carrying river-water in banghis from house to house, and they not only carried the water all over the town, but also to the suburbs, and water was purchased at the home of the speaker, three miles to the east of the town, at two annas per banghi load. For bathing and washing of clothes there were numerous tanks, and no want of water was ever felt in the town. The real difficulty was the *quality*, and not the *quantity*. The well-water was, as it is now, horribly stinking, and tanks frequently could not but contain very filthy water, utterly unfit for potable purposes. River-water too was muddy, and at times saline. The practice, therefore, was for all well-to-do people to obtain the river-water in the month of January, during the second quarter of the moon, and at ebb tides, and to store it in large jars for the consumption of the whole year. Those who could not afford to do this, drew their supplies for a fortnight at a time, on the 6th, 7th or 8th of the moon during ebb-tide. The water in such cases was invariably clarified by the addition of a small quantity of an emulsion prepared by rubbing the nut of the *Strichnos potatorum*, (*nirmali*) on a stone, or by the addition of a little alum. This promoted the precipitation of all earthy matter contained in the water. This clarification was resorted to even by those who drew their supplies daily, and in such cases the water was allowed to stand for 24 hours before it was drunk. The higher classes used porous sandstone filters, for improving their drinking water ; and many collected rain water and stored it for use. It was a common practice among rich Hindus and Europeans to set up large sheets on housetops, or on open courtyards, to catch the rain-water in gumlows, whence it was transferred to jars for use during the rainless months. The practice ceased since the importation of carbon filters from Europe. All these expedients were, however, troublesome, and not at all accessible to the poorer classes, who suffered greatly from unwholesome water. The filtered supply from Pultah has, therefore, proved a great blessing to them. The complaint now is that that supply is insufficient, and nothing short of a very large increase will suffice to remove it. In this respect a common mistake is the acceptance of European data for the calculation of the wants of a tropical population. The habits, customs and wants of the latter bear no relation to those of the former. The loss sustained by excessive heat during the greater part of the year, and the necessity of frequent washings and bathings, are such that even the doubling of the European datum would not cover them ; and it is of the utmost importance that this should be fully

borne in mind by those who are engaged in devising a scheme for increasing the water-supply of Calcutta. As shown by Mr. Pedler most of the existing tanks were very offensive, and should be obliterated as soon as possible, and this cannot be done until the pure supply is greatly increased, for in a tropical climate nothing can be a greater calamity than scarcity of water; and it is far better to have an abundance of impure water than a scanty one of pure water. No man, however intelligent he may be, will, when impelled by heat and thirst, abstain from impure water when he has nothing better at command. Europeans in this country did not always bear this fully in mind, and hence there was a great difference of opinion among them, and the people of the town.

Mr. Waldie said that he had listened with much interest to the statements that had been made. His own experiments, made many years ago, just before the new processes for the examination of potable waters had been published, were, notwithstanding the imperfection of previous processes, quite in accordance with those obtained more fully and perfectly by Mr. Pedler. He had found the tank waters he had examined generally very bad; even the waters of the best maidan tanks were decidedly inferior to the river water.

The paper will be published in full in the Journal, Part II.

2. *On the Identity of the place Upello near Delhi with Upaplava, mentioned in the Mahábhārata.*—By PANDIT RISHIKESH BHATTACHARYA of the Lahore Oriental College. Communicated by DR. G. W. LEITNER, Principal, Government College, Lahore.

(Abstract.)

The author, after rejecting various conjectures, made by different persons, as to where the kingdom of Virāṭa (to which Upaplava belonged) was situated, examines several passages of the Mahábhārata, bearing on the subject and comes to the conclusion, that it must have been situated to the south-west of Delhi, and that, consequently, Upello on the Delhi and Agra road may be the Upaplava of the Mahábhārata.

Dr. Mitra took exception to the statement of the Paṇḍit that the people of Midnapur consider their district to have been Virāṭa, and thought that the Paṇḍit must have confounded Midnapur with Dinajpur, which has often been described as the Virāṭa of the Mahábhārata. Dr. Mitra was satisfied that neither the one nor the other had any claim to that name. According to the Mahábhārata the Kurus went on a cattle-lifting expedition to Virāṭa, and it would be absurd to suppose that they could do so from Hastināpur, their capital, to either Midnapur or Dinajpur. Phonetic similitude has led some people to identify Virāṭa with modern Berar, but



that too was for the reason assigned untenable. The province must have been close to Delhi, and Mr. Talboys Wheeler had taken it to be modern Hariyáná, noted for its superior cattle, or some place near it.

Dr. Hoernle said that General Cunningham, too, in his "Ancient Geography of India" had determined the position of Viráta in the south-west of Delhi, where the town of Bairát is now. He also thought that on linguistic grounds there might be some difficulty in the proposed identification.

The paper will be published in full in the Journal, Part I.

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### LIBRARY.

The following additions have been made to the Library since the Meeting held in July last.

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No. 1073. *Crookes, W.*—On a Fourth State of Matter. *Post, Dr. J.*—On the composition and analysis of the Weldon Mud. *Kern, K.*—Some Remarks on Siemens-Martin Steel. *Vortmann, G.*—Detection and Determination of Chlorine in presence of Bromine and Iodine.

No. 1074. A New Patent Bill. *Mott, H. A.*—The Absorption of Sugar by Bone-black.

No. 1075. *Dewar, J.*—On the Lowering of the Freezing-point of Water by Pressure. *Gladstone, J. H.* and *Tribe, A.*—The Aluminium-Iodide Reaction. *Pasteur.*—On Virulent Diseases, and especially on the Disease commonly called Chicken Cholera. Artificial Indigo.

No. 1076. *Dewar, J.*—On the Critical Point of Mixed Vapours. *Leeds, Prof. A. E.*—On the Formation of Hydrogen Peroxide and Ozone during the Action of Moist Phosphorus upon Air.

No. 1077. *Nickels, B.*—Detection of Cotton-seed Oil in Admixture with Olive. *Dwight, G. S.*—Strong's Water-gas System.

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———. Entomologist's Monthly Magazine,—Vol. XVII, No. 193, June 1880.

———. Messenger of Mathematics,—Vol. X, No. 2, June 1880.

———. Annals and Magazine of Natural History,—Vol. V, No. 30, June 1880.

———. Nineteenth Century, No. 40, June 1880.

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*Greenwell, Rev. Canon.*—On Some Rare Greek Coins. *Colson, Dr. Al.*—Notice sur une monnaie de Tarente au revers de laquelle on a cru voir un personnage plaçant un fer au pied d'un cheval. *Thomas, E.*—The Indian Swastika and its Western Counterparts. *Gardner, P.*—Ares as a Sun-god and Solar Symbols on the Coins of Macedon and Thrace. *Creeke, Major A. B.*—On Silver Coins of Eanred and Ethelred II., of Northumbria. *Pownall, Rev. Canon A.*—Coins of the Stafford Mint.

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*Clausius, Prof. R.*—On the Behaviour of Carbonic Acid in relation to Pressure, Volume and Temperature. *Long, J. H.*—On the Diffusion of Liquids. *Ridout, R. H.*—On some Effects of Vibratory Motion in Fluids; on the attraction due to the Flow of Liquids from an expanded Orifice; and Laboratory Notes. *Wild, H.*—Complete Theory of the Bifilar Magnetometer and new Methods for the Determination of the Absolute Horizontal Intensity of the Earth's Magnetism as well as of the Temperature and Induction-coefficients of magnets. *Herschel, J.*—On the Determination of the Acceleration of Gra-

vity for Tokio, Japan. *Challis, Prof.*—Supplement to Researches on the Hydrodynamical Theory of the Physical Forces, including a Theory of the Microphone.

London. Publishers' Circular,—Vol. XLIII, Nos. 1026-27.

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Insanity and its difficulties. *Leeds, A. R.*—The History of Antozone and Peroxide of Hydrogen. *Morris, C.*—The Origin of Falling Motion.

New Haven. The American Journal of Science,—Vol. XIX, Nos. 112 and 113, April and May 1880.

No. 112. *Hunt, T. S.*—History of some Pre-Cambrian Rocks in America and Europe. *Venill, A. E.*—Synopsis of the Cephalopoda of the North-Eastern Coast of America. *Sherman, O. T.*—Observations on the Height of Land and Sea Breezes, taken at Coney Island. *Lockyer, J. N.*—New Method of Spectrum Observation. *Carmichael, H.*—Presentation of Sonorous Vibrations by means of a Revolving Lantern. *Rowland, H. A.* and *Barker, G. F.*—Efficiency of Edison's Electric Light.

No. 113. *Hunt, T. S.*—Chemical and Geological Relations of the Atmosphere. *Penfield, S. L.*—Apatites containing Manganese. *Hunt, T. S.*—Recent formation of Quartz and Silicification in California. Photographic Spectra of Stars. *Cooke, J. P.*—Atomic Weight of Antimony.

Paris. Annales de Chimie et de Physique,—Vol. XX, May and June 1880.

May. *Ogier, J.*—Recherches thermiques sur les combinaisons de l'hydrogène avec le phosphore, l'arsenic et le silicium. *Riemsdyk, A. D. van.*—Le phénomène de l'éclair dans les essais d'or et l'influence exercée sur ce phénomène par les métaux du groupe du platino. *Bourgoïn, E.*—Électrolyse de l'acide malonique. *Pellet, H.*—Études sur le rôle du noir animal dans la fabrication du sucre. *Cochin.*—Sur la fermentation alcoolique. *Govi.*—Les miroirs magiques des Chinois. Nouvelles expériences sur les miroirs chinois. *Ayrton, W. E.* et *Perry, J.*—Sur les miroirs magiques du Japon. *Bertin, A.* and *Duboscq, J.*—Production artificielle des miroirs magiques.

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No. 23. *Cahours, A.* et *Etard, A.*—Sur les dérivés bromés de la nicotine. *Boiteaux, P.*—Résultat des traitements effectués sur les vignes atteintes par le Phylloxera. *Cabanellas, G.*—Mesure directe de la résistance intérieure des machines magnéto-électriques en mouvement. *Pothier, E.*—Transformations des poudres de guerre dans les étuis métalliques des cartouches d'infanterie. *Magnier de la Source, L.*—Sur l'oxyde de fer colloïdal. *Marguerite, P.*—Sur un nouveau sulfate d'alumine (sulfate d'alumine sesquibasique). *Mégnin.*—Sur une modification particulière d'un Acarien parasite.

No. 24. *Wurtz, A.*—Sur la papaine. Contribution à l'histoire des ferments solubles. *Hébert.*—Histoire géologique du canal de la Manche. *Quatrefages, A. de.*—Craniologie des races nègres africaines. Races non dolichocéphales. *Chaveau, A.*—Nouvelles expériences sur la résistance des moutons algériens au sang de rate. *Becquerel, H.*—Recherches expérimentales sur la polarisation rotatoire magnétique dans les gaz. *Hennessey, H.*—Sur la figure de la planète Mars. *Certes, A.*—Sur l'analyse micrographique des eaux.

No. 25. *Faye*.—Sur la réduction des observations du pendule au niveau de la mer. *Janssen*, *J.*—Sur les effets de renversement des images photographiques par la prolongation de l'action lumineuse. *Berthelot*.—Sur la chaleur de formation des oxydes de l'azote et de ceux du soufre. *Huggins*.—Sur le spectre lumineux de l'eau. *Faye*.—Rapport sur un Mémoire de M. Peirce concernant la constance de la pesanteur à Paris et les corrections exigées par les anciennes déterminations de Borda et de Biot. *Elliot*.—Sur le problème de l'inversion. *Sebert*.—Sur un appareil destiné à enregistrer la loi du mouvement d'un projectile soit dans l'âme d'une bouche à feu soit dans milieu résistant. *Darboux*, *G.*—Sur les transcendentes qui jouent un rôle important dans la théorie des perturbations planétaires. *Forcrand*, *de*.—Sur un hydrate d'iode de méthyle.

No. 26. *Dessains*, *P.* et *Curie*, *P.*—Recherches sur la détermination des longueurs d'onde des rayons calorifiques à basse température. *Berthelot*.—Sur quelques relations générales entre la masse chimique des éléments et la chaleur de formation de leurs combinaisons. *Milne-Edwards*, *A.*—Sur une nouvelle espèce du genre *Dasyure*, provenant de la Nouvelle-Guinée. *Quatrefages*, *A. de*, et *Lamy*, *L.*—Craniologie des races nègres africaines; races dolichocéphales. *Chaudeau*, *A.*—Des causes qui peuvent faire varier les résultats de l'inoculation charbonneuse sur les moutons algériens. Influence de la quantité des agents infectants. Applications à la théorie de l'impunité. *Mares*, *H.*—Résultats obtenus dans le traitement des vignes par le sulfocarbonate de potassium. *Gostinsky*.—Sur une nouvelle forme de galvanomètre. *Sebert*.—Sur un appareil destiné à enregistrer la loi au mouvement d'un projectile soit dans l'âme d'une bouche à feu soit dans un milieu résistant. *Le Bon*, *G.* et *Noel*, *G.*—Sur l'existence dans la fumée du tabac, d'acide prussique, d'un alcaloïde aussi toxique que la nicotine et de divers principes aromatiques. *Bonchardat*, *G.*—Sur la transformation de l'amylène et du valérylène en cymène et en carbures benzéniques. *Dieulafoy*, *L.*—La zinc: son existence à l'état de diffusion complète dans toutes les roches de la formation primordiale et dans l'eau des mers de tous les âges. *Peuch*, *F.*—Sur la transmissibilité de la tuberculose par le lait.

No. 1. *Janssen*.—Sur la photographie de la chromosphère. *Chevreul*.—Sur la vision des couleurs. *Berthelot*.—Sur quelques relations générales entre la masse chimique des éléments et la chaleur de formation de leurs combinaisons. *Thalén*, *R.*—Sur les raies brillantes spectrales du métal scandium. *Troost*, *L.*—Sur la densité de la vapeur d'iode. *Nilson*, *L. F.*—Sur les poids atomique et sur quelques sels caractéristiques de l'ytterbium. *Miquel*, *P.*—Des bactéries atmosphériques.

London. *Revue Critique*.—Vol. IX, Nos. 24-28.

———. *Revue des deux Mondes*.—Vol. XXXIX, No. 4; Vol. XL, Nos. 1 and 2.

No. 1. *Cantacuzène-Altieri*, *O. la princesse*.—Le Mensonge de Sabine. I. *Facherot*, *E.*—Les nouveaux Jacobins. *Boissier*, *G.*—L'empereur Julien, d'après de récentes publications. *Fouillée*, *A.*—La morale contemporaine. I. La morale de l'évolution et du Darwinisme en Angleterre. *Blerzy*, *H.*—L'Angleterre au temps de la restauration. II. Le triomphe des conservateurs. *Valbert*, *G.*—La force et la faiblesse des gouvernements démocratiques.



London. *Journal des Savants*,—June 1880.

*Franck, A.*—Histoire de la philosophie en France. *Quatrefages, A. de.*—Les crânes finnois. *Lévyque.*—L'expression musicale. *Gruyer, A.*—Le Jeu de violon, par Raphaël.

———. *Revue Scientifique*,—Vol. XVIII, Nos. 51-52; Vol. XIX, Nos. 1-3.

### BOOKS PURCHASED.

FERGUSSON, J. *The Illustrated Hand-book of Architecture: being a concise and popular account of the different styles of architecture prevailing in all ages and in all countries.* 8vo., London, 1859.

MACCRINDLE, J. W. *The Commerce and Navigation of the Erythræan Sea; being a translation of the "Periplus Maris Erythræi" by an anonymous author, and of Arrian's account of the Voyage of Nearchos, from the mouth of the Indus to the head of the Persian Gulf.* 8vo., Calcutta, 1879.

MOOR, E. *The Hindu Pantheon.* 4to., London, 1810.

REEVE, LOWELL. *Conchologia Iconica*,—Nos. 322-3, 324-5, 328-9, 332-3, 334-5, 336-7 and 338-9.

SOWERBY. *Thesaurus Conchyliorum*,—Parts 33-34.

WHITNEY, W. D. *A Sanskrit Grammar; including both the Classical Language and the other Dialects of Veda and Brahmana.* 8vo., Leipzig, 1879.

PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
FOR NOVEMBER, 1880.

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The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 3rd November, at 9 o'clock P. M.

H. B. MEDLICOTT, Esq., F. R. S., in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the British Museum,—A Catalogue of the Greek coins in the British Museum (5 Vols.), edited by R. S. Poole.

2. From the Society of Telegraph Engineers,—Catalogue of Books and Papers relating to Electricity, Magnetism, the Electric Telegraph &c., including the Ronalds Library, by Sir F. Ronalds, edited by A. J. Frost.

3. From the Zoological Society of London,—Catalogue of the Library of the Zoological Society of London.

4. From the Marine Survey Department,—(1) General Report on the operations of the Marine Survey of India, for the year 1878-79, (2) Return of Wrecks and Casualties in Indian Waters for the year 1879, and (3) Charts of the Samuie Strait, Langsuen Roads and Approaches, and Beacon Roads.

5. From the St. Xavier's College Observatory,—Observations taken at the Observatory from January to June 1880.

6. From the Home, Revenue and Agricultural Department,—A Grammar of the Eastern Hindi compared with the other Gaudian Languages, by Dr. A. F. R. Hoernle, (2) The Life of Alexander Duff, D. D., L. D. (2 Vols.), by G. Smith, and (3) The Cave Temples of India, by James Fergusson and James Burgess.

7. From the Sanskrit Text Society,—(1) Vaitāna Sūtra, the Ritual of the Atharvaveda, edited, with Critical Notes and Indices, by Dr. R. S. Sharma, and (2) Vardhamāna's Ganaratna Mahodahi, with the Author's

Commentary. Part I, edited, with Critical Notes and Indices, by Julius Eggeling.

8. From the Authors.—(1) *The Kings of Kashmir*, by Jogesh Chandra Dutt, (2) *Kaiser Akbar. Ein Versuch über die Geschichte Indiens in sechzehnten Jahrhundert* (Part I), by Graf. F. A. Noer, (3) *A Brief Account of the Early History and Antiquities, Castes and Traditions of the Hamirpur District*, by V. A. Smith, and (4) *On the mode of Occurrence and Distribution of Diamonds in India*, by V. Ball.

9. From the Boston Society of Natural History,—*Contributions to the Geology of Eastern Massachusetts*, by W. O. Crosby.

10. From the University of Athens:—(1) *Catalogus Systematicus Herbarii Theodori G. Orphanidis. Fasc. I, Leguminosae*, by Th. de Heldreich, and (2) *Synopsis numerorum veterum qui in Museo numismatico Athenarum publico adservantur*, by A. Postolacca.

11. From the Munich Academy of Sciences,—*Ignatius von Loyola an der Römischen Curie*, by A. von Druffel.

12. From the Madras Government,—(1) *A classified Index to the Sanskrit MSS. in the Palace at Tanjore* (Part III), by A. C. Burnell, and (2) *some lead coins found in the Kistna District*.

13. From the Maharaja of Kashmir,—2 copies of Chapters 5—21 of the *Prayascitta Bhag*, with commentary.

14. From the Department of the Interior, U. S. America,—*Report of the U. S. Geological Survey of the Territories*, Vol. XII.

15. From the Society of Agriculture &c. of Lyons,—*Monographie Géologique des Anciens Glaciers et du Terrain Erratique de la partie moyenne du Bassin du Rhone* (Atlas), by A. Falsan and E. Chantre.

16. From the Foreign Department,—*Tribes of the Hindoo Koosh*, by Major J. Biddulph.

17. From R. L. Jack, Esq.,—*Geological Sketch Map of the District between Charter Towers Goldfield and the Coast*.

18. From the Meteorological Reporter to the Government of India,—*Report of the Meteorology of India in 1878*.

19. From the Government, N. W. P.,—(1) *Mathura, a District Memoir* (second edition), by F. S. Growse, and (2) *The Ramayana of Tulsi Dás*, Books III—VI, by F. S. Growse.

20. From the Secretary of State for India,—Vols. 59, 60 and 62 of the Hakluyt Society's publications—(1) *The Voyages and Books of John Davis the Navigator*, (2) *The Natural and Moral History of the Indies*, by Father Joseph de Acosta, Vol. I, (3) *The Commentaries of the Great Afonso Dalboquerque*, Vol. III.

21. From the Trustees Indian Museum,—*Indian Museum. Annual Report, Lists of Accessions, and Selected Extracts of Minutes*, April 1879 to March 1880.

22. From the Batavian Observatory,—Observations made at the Magnetical and Meteorological Observatory at Batavia, Vol. IV.

The following Gentlemen duly proposed at the September meeting of the Council were balloted for and elected Ordinary Members—

1. Lieut. R. R. N. Sturt, B. S. C., proposed by G. Hughes, Esq., C. S., seconded by P. Johnstone, Esq., C. S.

2. Babu Kshiroda Chandra Raya, proposed by Dr. R. L. Mitra, seconded by A. Pedler, Esq.

3. Rev. Charles Swinnerton, proposed by H. B. Medlicott, Esq., seconded by Alex. Pedler, Esq.

4. Babu Pramatha Nath Bose, B. Sc., F. G. S., proposed by H. B. Medlicott, Esq., seconded by W. T. Blanford, Esq.

The PRESIDENT announced to the meeting that, in accordance with Rule 7, the following Gentlemen had been balloted for and elected Ordinary Members by the Council during the recess—

1. R. W. Nicholson, Esq.

2. Lieut.-Col. M. G. Clerk.

3. Babu Benod Behary Mullick.

4. Babu Sib Chunder Nag.

5. Khalif M. Hassan, Khan Bahadur.

6. E. M. Sage, Esq., proposed by R. Gordon, Esq., seconded by A. Pedler, Esq.

7. R. C. Lees, Esq., proposed by L. Schwendler, Esq., seconded by A. Pedler, Esq.

The elections were confirmed by the general meeting.

The following Gentlemen are candidates for ballot at the next meeting.

1. W. Grierson Jackson, Esq., C. S., Mirzapur, proposed by H. Rivett-Carnac, Esq., C. S., seconded by Dr. G. Thibaut.

2. Dr. Kirton, proposed by Dr. J. M. Coates, seconded by J. Wood-Mason, Esq.

3. R. D. Oldham, Esq., A. R. S. M., proposed by H. B. Medlicott, Esq., seconded by W. T. Blanford, Esq.

4. Moulvie Dilawur Hasein Ahmad, proposed by Moulvie Kabir-uddin Ahmad, seconded by A. Pedler, Esq.

5. J. R. Napier, Esq., proposed by L. Schwendler, Esq., seconded by A. Pedler, Esq.

6. H. W. McCann, Esq., D. Sc. etc., proposed by Dr. Hoernle, seconded by A. Pedler, Esq.

The SECRETARY reported that Dr. D. O'Connell Raye and Mr. E. O'Brien had withdrawn from the Society, and that Pandit Mohanlal Vishnulal Pandia had compounded for his future subscriptions.

The SECRETARY reported that 4 gold coins from the Collector of Budaun had been acquired under the Treasure Trove Act.

With reference to the notice, at the May meeting, of works sanctioned for publication in the *Bibliotheca Indica*, the Secretary announced that Dr. L. Schroeder had been permitted to withdraw his edition of the *Maitráyani Samhitá* and that in its place the *Apastamba Sūtra* had been substituted, to be edited by Dr. R. Garbe. The *Apastamba Sūtra* is a very rare and important work connected with the Black Yajur Veda. It consists of three sections, divided into 30 chapters. The first section of 24 chapters contains the *Srauta Sūtras*. It is this section that will be edited by Dr. Garbe. The section on the *Dharmasūtras* has already been edited by Dr. G. Bühler, and that on the *Grihya Sūtras* is in the hands of Dr. Eggeling. Dr. Garbe's edition will give the text accompanied by the commentary of Rudradatta. The edition will be based on a collation of two or three complete and several fragmentary manuscripts of the work.

The SECRETARY read two letters from Major J. Waterhouse regarding the proceedings of the Blochmann Memorial Committee in England.

Major Waterhouse states in a letter, dated July 16th, that Mr. W. T. Blanford and himself had consulted with Mr. Grote, and that they had visited the studios of various sculptors in London. They had decided on entrusting the commission to Mr. E. R. Mullins, who has already executed a bust of the late Mr. Woodrow, which is now in the Calcutta University. Mr. Mullins is to receive one hundred guineas for making the bust of the late Mr. Blochmann. In a further letter received from Major Waterhouse, dated September 8th, he states that the model of the bust is making satisfactory progress, and Mr. Mullins had, in the opinion of Mr. Blanford and himself, secured a very fair likeness of the late Mr. Blochmann.

1. The Philological Secretary exhibited some gold and silver coins forwarded by Mr. H. Rivett-Carnac, and read some remarks by him on the same.

Mr. Rivett-Carnac says—

"I have the pleasure of forwarding for the inspection of the Society 2 silver and 4 gold coins recently dug up near Jellalabad, and procured for me there by Lieut. A. Durand of the Central India Horse.

"The two large silver coins are of Eucratides of a well known but I believe not common type. It will be noticed that they are in beautiful preservation.

"The other two silver coins are of Antiochus; on the obverse will be noticed what seems to be a 'horned Horse.'

"I have also obtained a gold coin of Antiochus of the same type and a gold one of Euthydemus which are both sent for the inspection of the Society. These coins are in beautiful preservation.

"I should be glad to know whether all these coins are known to the Society. Unfortunately I have no books with me to which I can refer.

"I have mentioned 2 silver coins of each but I send one only, as there is no object in sending two exactly the same.

"By this opportunity I also send 2 gold Roman Coins found by Col. Berkeley, Political Agent at Rewah, in the Maharajah's subterranean Treasury. The one appears to be of Septimus the other of Pertinax. Col. Berkeley has very kindly permitted me to submit them for the Society's inspection; and I am confident that his courtesy in the matter will be much appreciated by the members.

"In continuation of former correspondence I now send 2 gold coins, apparently Roman, found by Colonel Berkeley, Political Agent, Sutna, in the subterranean Treasury of the late Maharajah of Rewah after his death.

"Col. Berkeley to whom the credit of the discovery of these interesting coins is due, is good enough to desire that the Asiatic Society should have an opportunity of seeing these coins, and he would wish for the opinion of Dr. Rudolf Hoernle and General Cunningham thereon."

2. The Philological Secretary exhibited a photograph of 3 Indo-Aryans, sent for the inspection of the Society by Dr. G. W. Leitner.

3. The Secretary exhibited an Afghan helmet sent for the inspection of the Society by Lieut. R. C. Temple, and read a letter descriptive of it.

"I have the pleasure to send herewith a brass helmet sent down from Kabul by an officer at the front.

"It has no marks of age about it except the polish of the brass and the date on the plate which I read as 882 or 677 according to which side of the rim of the plate is considered uppermost. H. 882 would give us A. D. 1478 circ and H. 677 circ. A. D. 1280. I should not be inclined from its appearance to ascribe this age to the helmet.

"The chain appears to be English and not to belong to it.

"I read the plate thus inside

اول قواينوازي الرو اكبر

and round the rim

كارخانه لار ( ي ) السلطان كابل

date ۸۸۲"

Mr. Westland pointed out that the helmet was so distinctly modern and European in shape (regular Ellwood pattern), that there must be the gravest doubts as to its antiquity. The ornamentation too was the regular British idea of a lion-face and had nothing oriental about it. The only argument for its antiquity was the fact that in a factory-mark upon it the figures 8, 8, 2, appeared in contiguity, but they might represent any num-

ber of other things besides the Hijra date. In fact, even taking them as intended for a date, there was another unaccounted for figure beside the 2, namely an † or an alif. He could not pretend himself to any knowledge of such subjects, but he had been informed on enquiry that writers of Arabic characters sometimes reversed their usual practice of writing the figures thus—units, tens, hundreds, thousands, and wrote them like the English, *viz.*, thousands, hundreds, tens, and units. And if the figures upon this inscription were thus read, it gave the date 1288, exactly twelve years ago.

He also pointed out that the inscription referred the helmet to the “arsenal of the Sultan of Kabul,” and said that it was very doubtful if a potentate existed, except in recent times, who could claim that title.

A few remarks were made by several other members present on the manufacture and present appearance of the helmet, and the general opinion seemed to be that it was of very modern manufacture.

4. The Philological Secretary read a letter from Mr. C. Girdlestone regarding the legend on Mr. Gennoe’s medal, which was exhibited at the June meeting.

Mr. Girdlestone writes—

“I have just been looking through the Asiatic Society’s Proceedings (No. VI), for June 1880, and it appears to me that the legend on Mr. Gennoe’s medal quoted at page 100 means to convey the words Sri 2 (do) Swami Ji Jalh (or Jalhu).

“The use of Sri with a numeral after it to express the degree of honour is common in Nepal. Thus in official parlance the Maharaj Adhiraj (Sovereign) of Nepal is Sri Páñch (5) and the Prime Minister Sri Tin (3). The British Resident is also sometimes addressed as Sri Tin.”

Dr. Hoernle remarked that he was glad to see that Mr. Girdlestone’s reading of the inscription on the medal was a confirmation of that already given by Dr. Mitra and himself at the meeting of June.

5. A letter was read from Dr. Mitra forwarding an extract from a letter from General Cunningham on the locale of the two Buddha-Gayá inscriptions noticed in the Proceedings for April last.

Dr. Mitra says—

“In my remarks on the two Buddha-Gayá inscriptions, published in the Proceedings for April last, there is an omission which should be supplied. When I exhibited the inscriptions I knew not the exact locale where they had been found. General Cunningham has now favoured me with the information. In a letter, dated Simla, August 30, he says: ‘The two inscriptions which I brought from Buddha Gayá and which you have translated, were found in different places. The larger one was found in the *mound* to the north of the Tárádevi temple, where an excavation was made to furnish







bricks for the Burmese dwelling house. The other smaller inscription was found on the opposite side of the great temple; that is to the south of it. But neither of the inscriptions was *in situ*.' The statement that the inscriptions when found were not *in situ* is of great importance. It shows that they had been brought from somewhere else, and unless this is admitted the cave mentioned in one of them would be inexplicable. It is certain that the rubbish mounds did not exist when the cave was cut, and it could not therefore have been a cutting in a heap of earth, even if it could be assumed that such a cutting would be deemed worthy of an inscription. The record gives the locale of the cave to have been Jayapura, the site of which I have not yet been able to identify. A reduced facsimile of the record is annexed for ready reference. (Plate VIII.)"

The NATURAL HISTORY SECRETARY then exhibited the skin and skull of a male tailless rat which had been sent to the Society by Dr. J. E. T. Aitchison. The animal is recognized as the *Lagomys rufescens* which was first described by Dr. Gray from Afghanistan, and which was afterwards rediscovered by Mr. W. T. Blanford near Kohrad north of Ispahan in Persia, where it lives at elevations exceeding 8,000 feet. The present specimen was obtained by Dr. Aitchison at an elevation of from 11,000 to 12,000 feet amongst boulders on the Safed Koh Range, Mt. Sika Ram in the Kuram valley.

The following papers were read—

1. *On some experiments instituted to supply all the lines terminating at the Calcutta Telegraph Office with currents tapped from the main current produced by a Dynamo-Electric Machine.*—By LOUIS SCHWENDLER, Esq., M. I. C. E., &c.

Mr. Schwendler gave an outline of his paper explaining the latest experiments he had made in order to prove the practicability of his new method of supplying signalling currents. This method was published in the Journal of the Asiatic Society, Part II, Vol. XLIX, 1880, and in the Philosophical Magazine, No. 52, December 1879, Supplement. After certain incidental delays, the final trial came off on Sunday, the 29th August, 1880.

One of the Dynamo-Electric Machines, employed for lighting the sheds at Howrah Railway Station, produced the required strong main current, and the signal currents were conveyed from Howrah to the Calcutta Telegraph Office by an ordinary Telegraph line about 2 miles in length.

In all *eleven* long main circuits were supplied with telegraph currents in this manner, *viz.*, the lines to Bombay, Madras, Kurrachee and Rangoon. The currents sent from Calcutta, and the currents received at the out-stations were measured, and by it the satisfactory result was established that in all the lines, even in the longest, the tapped or machine currents were

considerably stronger than the currents produced by the ordinary signalling batteries at present in use.

The trial lasted for 3 hours under the direct supervision of Mr. C. B. P. Gordon, the Superintendent of the Bengal Division, who carefully watched the working of the office. The traffic was despatched with regularity in the ordinary manner.

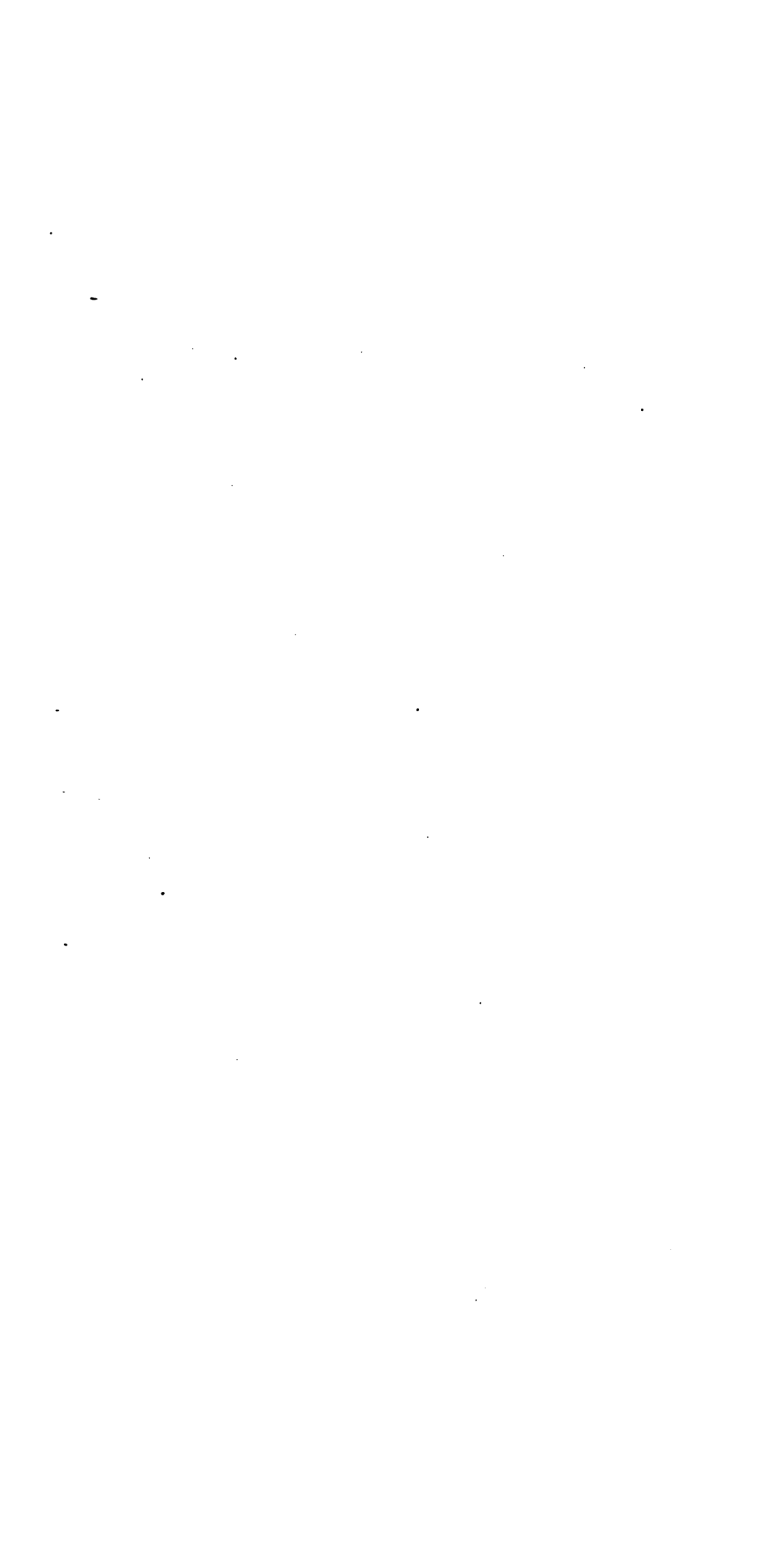
At the beginning of the trial the main current was produced through an iron wire of 0.21' diameter, offering a resistance of 1.5 B. A. U. This main current was carefully measured, and found to be equal to 36801 milli-oersteds. At the end of the trial the main current was produced through the arc of an electric lamp, giving a light of about 6000 Standard candles when measured under an angle of 45° with the horizon. In this latter case the main current amounted to 45706 milli-oersteds.\*

The total current tapped from the main current (when all the eleven lines were simultaneously sending) equalled 129 milli-oersteds, quite an insignificant fraction of the large main current.

Mr. Schwendler stated that this practical trial of the method had shown that it was perfectly reliable, and no practical Telegraph Engineer would doubt that it was very convenient to produce the currents in this manner. It was therefore under consideration to introduce the system at the Calcutta office. Mr. Schwendler concluded his paper with some suggestions for utilizing the larger portion of the current not required for Telegraph purposes, saying: "The useful work for the main current at night would most conveniently take the shape of an electric light to illuminate very efficiently the Signal-office. The electric light would produce at least 50 times less heat than if the same quantity of light was obtained by combustion, and this is no doubt a great advantage in a hot climate like that of India. During the day time the main current might be used for pulling the punkhas, lifting messages, or, more generally, for working a pneumatic system of despatching messages between the Head Telegraph office and local centres in Calcutta. If Calcutta had the good fortune to possess a colder climate, it might be suggested to use the heat developed by the main current in a coil of iron wire, for warming rooms. It would then only be necessary to lead the wire along the walls in a manner similar to that in which rooms are often heated by hot water pipes; only the electrical method would be far more economical. The quantity of heat given out by such a wire is by no means small. In one case it was equal to 20473  $\Omega$  ergs per second equal to 488 Grm. degree-centigrade per second. This is about equal to the heat produced by an ordinary Ger-

\* One Oersted is equal to one Weber per second.

One Milli-Oersted is equal to one Milli-Weber per second.





*Cell of the Palaeolithic Type, discovered at Thandiani, Punjab, by Charles Francis Massy Suynnerston, September 10th. 1880. Elevation. 3,400 ft. Original size.*

nan Stove consuming 6 lbs of coals per hour, supposing that the loss of heat when coals burn under a steam boiler is about four times greater than when they burn in a German Stove. It appears therefore that the heat emanating from the wire should suffice to keep a moderately sized and ordinarily ventilated room at a comfortable temperature even when situated at the highest latitude."

The paper will be published in full in Part II of the Journal.

2. *On a Celt of the Palæolithic type, found at Thandiani, Punjab, September 10th, 1880, by Charles Francis Massy-Swynnerton. By the REV. CHARLES SWYNNERTON.*

This unmistakeable relic of the Stone Age is especially interesting as being, I believe, only the second of its kind which has yet been discovered in the Punjab.

The first was found in the vicinity of Attock by Mr. W. Theobald, and a description of it appeared in the Records of the Geological Survey, vol. XIII, Part 3.

A front and a side view of the present specimen, exactly the size of the original, are given in Plate IX. The stone out of which it was chipped is black close-grained limestone. Its weight is thirteen tolas. Its edges and angles are considerably worn from the effect of soft pressure, or long exposure. It was found by my little son. The peculiarity of the shape of this interesting curiosity attracted his fancy in one of his daily walks, and he brought it back with him to the bungalow as a plaything, without of course knowing its nature or its value.

It should be added that the geological formation of the locality in which it was found is almost uniformly light grey limestone (*not* of the character of that of which the celt is fashioned), and that the elevation is about 8,400 feet.

*Contributions to the History of Bundelkhand.—By V. A. SMITH, C. S.*

Abstract of Part I.

Mahoba traditions assert that a Gaharwár Ráj at some undefined date succeeded the famous Chandel dynasty.

The traditions are indistinct, and little is known of the dynasty except that many tank embankments were made in its time; a list of eleven of these is given, all of them being situated within a radius of 15 miles from Mahoba.

This circumstance indicates that the Gahawár principality was a small one.

It is conjectured that it was established in the seventh century, after the dismemberment of the kingdom of Harsha Varddhana king of Kanauj, which doubtless included Mahoba.

The Gabawár rulers of Bundelkhand may have been connected with the Gabawár dynasty of Kanauj.

According to the Mahoba traditions the Gaharwárs were succeeded by Parihár chiefs, who were displaced by the Chandels.

General Cunningham is quoted to show that the little state of Uchahara or Nagod, between Allahabad and Jabalpur, which is still ruled by a Parihár chief, is a fragment of the larger Parihár kingdom which included Mahoba.

The traditions of several places in the Hamirpur District affirm the former existence of a large Parihár State.

The traditional dates assigned for the establishment of the Chandel dynasty are then examined.

These dates are variously given as 204 : 225 : 661 : 677 : and 682, Samvat.

The writer believes that the dates 204 and 225, should be, as General Cunningham suggested, referred to the era of Sri Harsha in 607 A. D. ; and, differing from General Cunningham, suggests that the dates 661, 677 and 682 should be read 561, 577, and 582, and referred to the newly discovered Chedi or Kulachuri era beginning in 249 A. D.

The date 831 A. D. is assumed as the date for the overthrow of the Parihárs by the Chandels.

Some miscellaneous traditions relating to early Parihár immigrations into Bundelkhand are then given.

#### Abstract of Part II.

The general outline of the Chandel genealogy and chronology having been already settled, this essay deals with disputed and doubtful points, and the collation of the published and translated inscriptions of the Chandel dynasty is carried further than has yet been attempted.

The writer also aims at setting forth in an intelligible and concise form all that is now known regarding the reign of each of the Chandel kings.

The appended chronological table sets forth the principal conclusion which have been reached, and will be found on examination to differ considerably from any hitherto published.

Kírtti Varmma I (*alias* Deva Varmma Deva *alias* Bhúmipála), who reigned from about 1149 to 1150 A. D., is held to have been the conqueror of Kámer Kulachuri king of Chedi *circa* 1095 A. D., and to be the Kí Brahm of tradition.

Gaya Varmma of the coins and of the Man-Chhatarpur and Ká No. II inscriptions is shown to be the same as Kírtti Varmma (the second of the Angási copper plate).

It is further proved that only one Sallakshana Varmma reigned, not two, as has been supposed.

The prominent position of the Jain sect in the reign of Madana Varmma (*circa* 1130-1165 A. D.) is noticed.

The second conquest of Chedi by Madana Varmma is discussed; the writer believing this event to have occurred about the year 1160 A. D.

Reasons are given for believing that about that time the Chandel dominions extended to Bilharí near Jabalpur, the territory now known as the Ságara and Damoh districts being administered by a chief still remembered as Rájá Belo or Belá.

Madana Varmma Deva was succeeded by Paramárdi Deva, commonly known as Parmál or Parmár, who died in 1202.

Attention is called to the fact that none of the coins of this king are known, and that no building can with certainty be ascribed to him, and that only one inscription appears to be known as certainly dated in his reign. Reason is shown for believing that little credence can be given to Chand's account of the war between Parmál and Prithiráj of Delhi.

*Chronological Table of the Chandel Dynasty 831—1182 A. D.*

No.	Rájá.	Date A. D.	Event.	Authority.
1	Nánika.	831	Accession, and overthrow of Pariháras at Mahoba.	Tradition and calculation.
2	Vákpati.	850	Accession.	Date calculated.
		862	Bhoja king of Kanauj in possession of Chanderí.	Inscription at Chanderí, Arch. Report, IX, 84.
3	Vijaya.	870	Accession.	Date calculated.
4	Ráhila.	890	Accession.	....
5	Harsha.	910	Accession.	....
6	Yáso Varmma.	930	Accession.	....
7	Dhanga.	950	Accession.	....
		954	Building temple at Khajuráho.	Chaturbhuj inscription.
		978	Assisted in battle of Lamghán.	Farishta.
		998	Grant of land.	Nunama, No. II inscription.
		999	Death at Prayág.	Láláji inscription.
8	Gaṇḍa Deva.	999	Accession.	Ditto and Man Chhatarpur inscription.
		1008	Assisted Rájá Jaipál of Lahore against Mahmúd of Ghazní.	Farishta.
		1011	Rájá Kokalla.	Inscription at Khajuráho.
		1021	Conquered Kanauj.	Farishta.
		1023	Surrendered Kálanjar to Mahmúd of Ghazní.	
9	Vidhyádharma Deva.	1025	Accession.	Date calculated.



No.	Rájá.	Date A. D.	Event.	Authority.
		1030	Gángaya Deva king of Chedi ruling at Tripuri.	Abú Rihán.
10	Vijaya Pála Deva.	1035	Accession.	Calculated date.
11	Kírtti Varmma Deva the First, <i>alias</i> Deva Varmma Deva <i>alias</i> Bhúmipála.	1049	Accession.	Date calculated.
		1050 circa.	Grant of land by Deva Varmma Deva.	Nunama, No. I inscription.
		1080	Defeat of Karna of Chedi. First issue of Chandel coinage.	Exact date conjectured.
		1097	In possession of fort of Deogarh.	Inscription at Deogarh.
12	Sallakshana Varmma Deva.	1100	Accession.	Date calculated.
13	Jaya Varmma Deva <i>alias</i> Kírtti Varmma Deva the Second.	1110	Accession.	Date calculated.
		1116	Láláji inscription re-written.	Láláji inscription.
14	Prithví Varmma Deva.	1120	Accession.	Date calculated.
15	Madana Varmma Deva.	1130	Accession.	Date calculated.
		1131	Image of Varadá set up at Kálinjar.	Maisey's, No. IV inscription.
		1133	Grant of land.	Angásí copper plate.
		circa.		
		1143	Construction of Bela Tál at Jaitpur.	Tradition.
		1154	Jain image set up at Mahoba.	Nemináth inscription.
		1158	Ditto ditto.	Sumatináth ditto.
		"	Ditto, at Khajuráho.	Sambhunáth ditto.
		circa.		
		1160	Conquest of Chedi.	Date conjectured.
		1163	Jain image set up at Mahoba.	Ajitanáth inscription.
		1164?	Inscription set up at Kondalpur?	Sir Wm. Sleeman.
		circa.		
		1160	Rájá Bels built Singor-garh. Bilhari held	Ditto, and Central Province
		1165	by a Chandel gover-nor.	Gazetteer.
16	Paramárdi Deva, known as Parmál or Parmár.	1165	Accession.	Date calculated.
		1167	An inscription record-ed.	Inscription.
		? 1171	Inscription recorded at Kálinjar.	? Inscription.
		1182	Capture of Mahoba by Píthiráj of Delhi.	Inscription of Píthiráj (unpub-lished).

*Inscriptions of the Chandel Dynasty of Bundelkhand.*

No.	Inscription.	Date.		Reference.
		Samvat.	A. D.	
1	Chaturbhuj.	1011	954	The inscription is on a large slab built into the wall on the right side of the entrance to the Chaturbhuj temple at Khajuráho. It has never been published nor translated. Noticed in Arch. Report, II, 426.
2	Jinanáth.	1011	954	On left jamb of door of Jinanáth's temple at Khajuráho. Never published nor translated in full. Abstract translations in Arch. Report, II, 433 and J. A. S. B. XXIX, p. 395. See also J. A. S. B. XLVIII, Part I, p. 287 and plate.
3	Nunama, No. II.	1055	998	Copperplate; original in Indian Museum. Transcribed and translated in full in J. A. S. B. XLVII, pp. 80 seqq.
4	Láláji or Viśvanáth.	1056	999	On a large slab built into wall inside entrance of Láláji or Viśvanáth temple at Khajuráho. Translated by Mr. Sutherland in J. A. S. B. for 1839. Vol. VIII. p. 159, but with many errors, some of which were corrected by General Cunningham in Proc. A. S. B. for 1865 (1) p. 99.
5	Nunama, No. I.	1107	1050	As No. 3.
6	Deogarh.	1154	1097	Engraved on rock. Neither published nor translated; referred to in Arch. Report, IX, 108.
7	Inscription at Mahoba.	—	—	Gave genealogy from Dhanga to Kirtti Varmma. Mentioned in Arch. Report, II, 447, but never published nor translated, and the original not now to be found.
8	Supplement to Láláji inscription.	1173	1116	As No. 4.
9	Maisey's No. IV.	1188	1131	Original at Kálinjar, near figure of 'Mahádeo ká putra'; letters very faint. Transcribed and translated in J. A. S. B. XVII. (1) pp. 191 and 321-322. Text and translation require revision. Erroneously mentioned dated in S. 1288 in Arch. Report, II, 448, number 33.
10	Angáś.	1190	1133	Copperplate; original with Mr. A. Cadell, O. S. Facsimile and transcript and translation in J. A. S. B. Vol. XLVII, Part I, pp. 73 seqq.
11	Nemináth.	1211	1154	Jain Statue at Mahoba. Noticed by General Cunningham in Arch. Report, II, 448. The position of the statue is not known.

No.	Inscription.	Date.		Reference.
		Samvat.	A. D.	
12	Sambhunáth.	1215	1158	Jain statue at Khajuráho. Translated in Arch. Report, II, 435 and noticed <i>ibid.</i> p. 448. Position of statue now is not known.
13	Sambhunáth.	1215	1158	Jain statue lying in water under embankment of Kírat Sagar at Mahoba. Facsimile of part of inscription in J. A. S. B. Vol. XLVII, Part I, Plate XV.
14	Ajitanáth.	1220	1163	Jain statue at Mahoba, position not now known. Noticed in Arch. Report, II, 448.
15	Man-Chhatarpur.	—	—	Translated by Lieut. Price in Asiatic Researches, XII, 351.
16	Kondalpur. (?)	915 of Chedi era.	1164	Mentioned as existing at a temple in Kondalpur, Central Provinces, and said to be dated 815 Samvat by Sir Wm. Sleeman in J. A. S. B. for 1837. Vol. VI, (2), p. 627 note. <i>Vide supra</i> discussion of reign of Madana Varmma.
17	Mahoba.	1224	1167	Inscription at Mahoba, mentioned in list Arch. Report, II, 448, but nature of inscription and precise locality not mentioned. Original not now forthcoming.
18	Maisey's No. I.	91228	91171	J. A. S. B. XVII, (1) pp. 313-317. Gazetteer N. W. P. Vol. I, p. 15 note. Arch. Report, II, 448. Original at Kálinjar.
19	—	1239	1182	Unpublished inscription of Prithiráj, referred to by Genl. Cunningham, Arch. Report, IX, 153, and in private letter-records defeat of Parmál by Pirthiráj.
20	Mahoba, inscription at bungalow.	1240	1183	Abstract given in Proc. A. S. B. for 1879, p. 243. Original at Engineer's bungalow near Mahoba. Full text and translation not yet published.
21	Dahi copper plate.	1337	1280	Arch. Report, II, 455. In No. 34 of table <i>ibid.</i> p. 448, the name of the Rájá is wrongly given as Vira Varmma. Neither original nor copy forthcoming, nor translation.
22	Jayadurga, (? Ajegarh or Kálinjar) Inscription.	1345	1288	J. A. S. B. VI, 881, and Part III of this essay.
23	Maisey's No. II.	—	—	J. A. S. B. XVII, (1) 317-320, transcript and translation; original at Kálinjar. No date; but quoted in No. 30 of table Arch. Report II, 448 as being dated S. 1372 = A. D. 1315.

## Abstract of Part III.

The statement of General Cunningham and other writers that Kutb-ud-dín Aibak attacked Kalinjar twice, that is to say, in 1196 A. D. as well as in 1202 A. D., is shown to be erroneous and to rest on a misinterpretation of Farishta.

The passages in Farishta and the contemporary Táj-ul-Maásir relating to the attack on Rájá Parmál Chandel in 1202 A. D. are quoted and discussed, and Chand's stories about the end of Parmál are proved to be untrue.

The Mahoba Kanungo's traditions relating to the events which followed the defeat of Parmál by Prithiráj in 1182 and the rise of the Bundelas in the 14th century are recited at length as a basis for the following disquisition.

The evidence relating to the existence of powerful Bhar chiefs at Mahoba and in the neighbourhood of Kálinjar is fully discussed, with the result that the Bhar rule in Bundelkhand may be dated approximately between the years 1240 and 1293 A. D. The identification of the Dalaki-Malaki or Dalaki-wa-Malaki who was, according to the Muhammadan historians, defeated by Ulúgh Khán in 1248 A. D., with the Tiloki and Biloki or Dal and Bal of Audh tradition is accepted, and this personage is further identified with the Bhar chieftain in power at the time.

The identification of Dalaki-Malaki with the Malika of the Jayadúrga (or so-called Ajegarh) inscription dated 1345 Samvat is rejected.

His identification with Rájá Trailokya Varmna Chandel is also shown to be impossible.

The conjecture is hazarded that the Bhars were originally one of the hill and forest tribes of Central India.

The genealogy of the Chandel princes who succeeded Parmál as Rájás of Kálinjar is discussed in connection with General Cunningham's notice of Col. Ellis' Dahi copper plate inscription dated S. 1337.

According to tradition the Bhar rule at Mahoba was overthrown by a Musalmán attack. Reason is shown for believing that this attack probably occurred in the year 1293 A. D., when Alá-ud-dín defeated the Hindús of Bhilsa.

About that time the government of Mahoba appears to have been entrusted by the Muhammadans to the Khangárs of Garh Kurár.

The Khangárs were displaced by a Gaharwár adventurer, the date of which event is shown to be approximately 1340 A. D.

From this Gaharwár adventurer the Bundelas are descended, being apparently the offspring of a marriage between the Gaharwár and a Khangárin.

The following chronological table summarizes the results of the investigation.

*Chronological Table 1182—1352.*

Event.	Date.		Reference.
	Hijri or Samvat.	A. D.	
Defeat of Parmál by Prithiraj, .....	1239 S.	1182	Unpublished inscription of Prithiraj. (Cunn.)
Capture of Kálinjar, Kálpí and of Mahoba "capital of the principality of Kálpí," by Kutb-uddin Aibak. ....	599 H.	{ 1202	Farishta and Táj-ul-Máásir.
Death at Kálinjar of Rája Parmál Chandel, Accession at Kálinjar of Rája Trailokya Varmma Chandel, .....	..	..	Táj-ul-Máásir.
	..	..	Dahi copper plate.
Mahoba held successively by Taur Súba, the Mewátis and the Gond, .....	..	{ circa 1203 to 1239	Mahoba tradition.
Capture of Gwáliar and defeat of Parihár Rája by Altamish, .....	630 H.	{ 1232	Farishta and Táj-ul-Máásir.
Accession at Kálinjar of Sandhira Varmma Chandel, .....	62	{ circa 1234	Conjecture and Dahi copper plate.
Defeat of Chahada Deva of Narwar, .....	632 H.	1234	Tabaqát-i-Násiri.
Occupation of Mahoba by a Bhar chief, ..	..	{ circa 1240	Tradition and conjecture.
Occupation of Mauze Bharwára in Pamvári by Lodhis during reign of Rája Bhar of Mahoba, .....	1300 S.	1243	Local tradition.
Occupation of villages on bank of Dhasán river by Parihárs from Gwáliar, .....	1303 S.	1246	Local tradition.
Kírat Pál Rája at Kálinjar, .....	1309 S.	1252	Mahoba tradition.
Foundation of shrine of Pír Mobárik Sháh at Mahoba, .....	..	..	Ditto.
Defeat of Dalaki-Malaki between Karra and Kálinjar by Ulúgh Khán, .....	645 H.	{ 1248	Farishta and Tabaqát-i-Násiri.
Ulúgh Khán 'marches towards' Kálinjar, ..	..	1251	Tabaqát-i-Násiri.
Rája Sandhira Varmma Chandel makes a grant of land, .....	1337 S.	1280	Dahi copper plate.
Rája Kírat Singh Bhar makes at Kálpí a grant of land in Mahoba, .....	..	..	Copy of sanad below ing to Kanungo Mahoba.
Rája Bhoja Varmma Chandel, probably at Kálinjar, .....	1345 S.	1288	Jayadúrga inscrip
Nána Káyatt his minister, .....	..	..	....
Ala-ud-din's expedition against the Hindus of Bhilsa, .....	692 H.	1293	Farishta.
Defeat of the Bhar Rája of Mahoba by Malik Hasn Sháh, .....	..	ditto (?)	Local tradition.
Khangárs of Gagh Kurar appointed governors of Mahoba by Delhi court, .....	..	{ circa 1300	Local tradition.
Conquest of Málwa by Ain-ul-Mulk Multáni, .....	704 H.	1304	Farishta.
Erection of mosque at Bhainsa Darwaza, Mahoba, in reign of Ghiyás-ud-din Tughlak, .....	722 H.	1322	Inscription on
Khangárs of Gagh Kurar and Mahoba overthrown by a Gaharwár adventurer, founder of Bundela clan, .....	1400 S.	circa 1340	Tradition.
Malik-us-Shark Nasir-ul-Muik governor of Mahoba, Karra and Dalaman, .....	..	{ circa 1352	Tarikh-i-Sháhí.

4. *English Translations of some Baloochi Poems. Part II.*—By  
M. LONGWORTH DAMES, Esq., C. S.

This paper will be published in the Journal, Part I.

5. *Coins Supplementary to Thomas' Chronicles of the Pathan Kings of Delhi. Part II. With two Plates.*—By CHAS. J. RODGERS, Esq.,  
*Principal of the Normal College, Amritsar.*

(Abstract.)

This paper is a continuation of the author's article, which was published in No. 2 of the Journal of this year. It describes 33 hitherto unpublished coins, beginning with Khusrav Malik; among them several gold and silver coins.

This paper will be published in the Journal, Part I.

6. *Copper Coins of Akbar. With two Plates.*—By CHAS. J. RODGERS, Esq.,  
*Principal, Normal College, Amritsar.*

(Abstract.)

This paper describes 28 copper coins of the Emperor Akbar. The author discusses the value of the coins called *dām* and *tanke* respectively, and comes to the conclusion that 200 tankes and 160 dāms must have been severally equal to 1 Rupee. Accordingly he calculates, that Akbar's revenues must have been equal to Rs. 32,000,000 or £3,200,000, according to the statement of Nizām-uddīn, or to Rs. 35,400,000 or £3,540,000 according to Abu'l Fazl; a calculation which differs widely from that of Mr. Thomas who gives £32 millions and £86 millions respectively.

This paper will be published in the Journal, Part I.

7. *Notes on and Drawings of the Animals of various Indian Land-Mollusca (Pulmonifera).*—By LIEUT.-COL. H. H. GODWIN-AUSTEN,  
F. R. S., F. Z. S.

For some years previous to his appointment to the Second Yarkand Mission, Dr. Stoliczka had been working at the anatomy of Indian land-molluscs, and had enriched this Journal with many valuable papers. Amongst the numerous drawings made by native artists under his superintendence were found, after his death, some excellent coloured sketches from life of the animals of various species, with descriptions of the colours of the soft parts written in pencil on the margins of the paper. The author has pasted these drawings in a scrap-book, and, as they were fast becoming illegible, has transcribed the notes, names, and localities as well as he was able to decipher them.

As it may be some years before many of these species are obtained again by a naturalist with the means and ability correctly to delineate

them, the author has thought that lithographed copies published in this Journal would be not only preserving, but in a measure continuing the labours of so good an observer, and has accordingly prepared two plates illustrating certain species of the family *Zonitidæ*. Stoliczka's identifications and remarks are given in full for each species figured in the present paper, and some notes from the author's field-book, with a few identifications of Messrs. Blanford and Nevill, have been added.

The paper will be published in full with two plates in the forthcoming number of the Journal Part II.

8. *On a Species of Trochalopteron from Travancore*.—By W. T. BLANFORD, F. R. S.

In this paper the author describes a new species of *Trochalopteron* obtained by Mr. F. W. Bourdillon in the S. Travancore Hills. The species, which is named *T. meridionale*, is distinguished from *T. Fairbanki*, its nearest ally, by the much shorter white superciliary stripe terminating above the eye, by there being no brown band behind the eye, by the middle of the abdomen being white, and by other characters.

The paper will be published in the Journal, Part II, No. 3, for the current year.

9. *On a new Species of Papilio from South India, with remarks on the Species allied thereto*.—By J. WOOD-MASON.

In this paper the author describes a new species of rhopaloceros *Lepidoptera* belonging to the genus *Papilio*. The new species is nearly allied to *P. Mahadeva*, Moore, from upper Tennasserim, and is distinguished therefrom by having a submarginal row of spots in the fore-wing in both sexes, and by other characters; it is named *P. Dravidarum*. The paper concludes with some general remarks on allied species; it will be published with illustrations in the forthcoming number of the Journal Part II.

10. *Description of the Female of Hebomoia Roepstorffii*.—By J. WOOD-MASON.

The male of this species was described in the last number of the Journal. For the opportunity of describing the opposite sex, the author is indebted to the kindness and courtesy of Captain G. F. L. Marshall, R.

Coloured figures of both sexes will eventually be published in the Journal.

## LIBRARY.

The following additions have been made to the Library since the Meeting held in August last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,  
presented by the respective Societies and Editors.

- Batavia.** K. natuurkundige Vereeniging,—Natuurkundig Tijdschrift voor Nederlandsch-Indië, Vol. XXXIX.
- Berlin.** K. preuss. Akademie der Wissenschaften,—Monatsbericht, April, May and June, 1880.
- Bombay.** The Indian Antiquary,—Vol. IX, Parts 109—111.
- Bordeaux.** La Société de Géographie commerciale,—Bulletin, Nos. 14—18, 1880.
- Boston.** Society of Natural History,—Proceedings, Vol. XX, Parts 2 and 3.  
———. Memoirs, Vol. III, Part I, No. 3.
- Buenos Aires.** Sociedad Científica Argentina,—Anales, Vol. VI, No. 3.
- Calcutta.** Geological Survey of India, Memoirs,—Vol. XVI, Part 2.  
*King, W.*—The Gneiss and Transition Rocks, and other Formations of the Nellore portion of the Carnatic.
- . Palæontologia Indica, Series II, XI, XII;  
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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
FOR DECEMBER, 1880.

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The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 1st December 1880, at 9 P. M.

H. B. MEDLICOTT, Esq., F. R. S., President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the British Museum,—Catalogue of Oriental Coins, Vol. V, by S. L. Poole, edited by R. S. Poole.
2. From the Surveyor General of India,—Synopsis of the Results of the Operations of the Great Trigonometrical Survey of India, Vols. VIII and IX.
3. From the Home, Revenue and Agricultural Department,—the Industrial Arts of India, by Dr. G. C. M. Birdwood.
4. From the Superintendent, Government Central Museum, Madras, 10 gold Viraraya Fanams.
5. From the Superintendent, Geological Survey of India,—Popular Guide to the Geological Collections in the Indian Museum, Calcutta.
6. 3—Meteorites, by F. Fedden.
6. From the Author,—a Collection of Gesture-signs and Signals of the North-American Indians, with some comparisons, by Lt.-Col. G. S. Gallery.

The following Gentlemen duly proposed and seconded at the last meeting were balloted for and elected Ordinary Members—

W. Grierson Jackson, Esq., C. S.

Moulvie Dilawar Hasein Ahmad.

J. R. Napier, Esq.

H. W. McCann, Esq., D. Sc.

Dr. Kirton.

R. D. Oldham, Esq., A. R. S. M.

The SECRETARY reported that the following Gentleman had intimated his desire to withdraw from the Society—

W. T. Webb, Esq.

The SECRETARY reported that the elections of Rāja Siva Prāsād and of Mr. W. P. Johnston had been cancelled under Rule 9.

The SECRETARY read a letter from the Rev. C. Swynnerton forwarding a sketch of a sculptured stone pendant, with a note on the same.

Mr. Swynnerton writes:

“I beg to enclose a rough pencil-sketch of a curious relic which I find among my specimens of Yusafzai sculpture. If you will kindly exhibit it to the meeting of the Society I shall feel greatly obliged.

“Last winter I visited two very singular boulders in the neighbourhood of the Indus at Attock. One is of granite, the other of limestone. They are enormous in size, and they both exhibit ‘cup-marks’ or ‘elf-cups’ on their upper surfaces. These marks are very perfect and some of them are in regular lines. The granite specimen was first seen by Mr. T. Barlow, of the Inland Revenue, the other of limestone was discovered by me.

“I shall be glad to send you, later on, sketches and descriptions of these two relics if the Society would care to have them.”

The sketch sent was of a sculptured pendant or jewelled ornament worn from the neck, and was the size of the original. The sketch was taken from a piece of sculpture, in slate, which belongs to the ancient Buddhist remains of the Yusafzai valley. Attention was directed to the winged Cupid with which the ornament terminates. The figure is that of a boy. The hands have been broken, but they appear to have been joined together in the usual position of prayer, or adoration, so common among these sculptures. Mr. Swynnerton is doubtful whether there is any such idea of Eros or Cupid, winged, in Hindu mythology, or whether this figure is another proof of the former influence of Greek art in the Punjab.

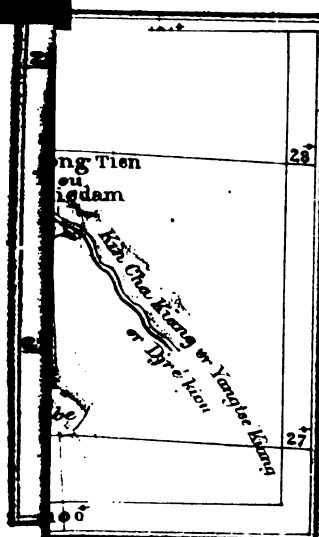
The NATURAL HISTORY SECRETARY then exhibited some specimens of *Papilio* from South India, representing a new species *P. morgani*.

The following papers were read—

1. *Description of a new species of Brackish-water Mollusca.*—By G. NEVILL, C. M. Z. S.

This paper will appear in the Journal, Part II.

PLATE X.



General's Office, Calcutta, January 1861.



2. *On the Eastern Frontier of Thibet.*—By M. DESGODINS.

The western and southern boundaries of Thibet proper are well known, because they are adjacent to the English Indian empire, either immediately or mediately through the states of Cashmire and Ladak, Nepaul and Sikkim which are allies of the English Government. The northern boundary too is very well defined, being formed by the immense tract of mountains known under the Chinese name of Kuenlen. This range begins westwards at the Karakorum, and runs to the east as far as the Kookoonor mountains. The eastern boundary on the other hand is almost unknown because it has been drawn through a country inhabited by people of the same race who are subjected to the same Chinese government though in a different manner. This then is a geographical problem of great interest and importance, and, as I have lived for some period in this almost unknown land, I will endeavour to give all the information on this subject I have been able to collect.

Let us start from a well known and indisputable point, the upper Assam country encircled by the Himalaya mountains. At the north-east of the valley, just beyond the Bramakhund on the hills, you find the savage tribe of the Mishmis whose Thibetan name is Nahong. As soon as you have crossed over the Himalayas and the Mishmi tribe, going to the east, you reach the frontier of Thibet proper. This is the district or Subprefecture of Dza-yul, which is under the jurisdiction of the Deba or prefect of Song-nga-kieu-dzong. This prefect governs also two other districts, that of Djrooba, which is exclusively peopled by shepherds living under tents, and that of Tsarong which is well peopled, and which is at the mouth of the Ou-kio river where it flows into the Lou-tse-kiang, and extends further down on the two banks of the Lou-tse-kiang (the Ngeu-kio of the Thibetans and the Salwen of the Europeans). The prefecture and its three subdivisions are to be found in that tract of land which extends from the foot of the Mishmi Himalaya to the Salwen and from 28° to 29° N. latitude; Dza-yul is at the east, Djrouba to the south, Tsarong to the south-east, Song-nga-kiendzong to the north-east. They say that this country is relatively well peopled and rich. To the south of Dza-yul and Djrouba are numerous savage, independent tribes belonging to the basin of the Irrawaddy river. To the north, is the principality of Po-yul which does not at all acknowledge the Lhasa government, and very little of the authority of the Chinese government; they would not be reluctant to have commercial intercourse with Europeans if they could. To the south of Tsarong, on the banks of the Salwen is the small Lou-tse tribe which belongs to the Yun-nan Chinese province. If I dwell somewhat at length on this country, whose area comprises only a little more than one degree of latitude and longitude, it is because of its being the only way through which the great river of

Thibet, the Yar-klou-tsangpo can flow if it goes down to the Irrawaddy. I have, however, been told over and over again by natives well acquainted with the country, that there is no large river flowing through it but only small ones. If so, the Tsangpo cannot be the upper course of the Irrawaddy.

A little below  $28^{\circ}$  N. lat. the frontier of Thibet crosses the Lou-tse-kiang (Salwen), and ascending a very steep spur on the left bank, reaches the main ridge of the mountain range, which separates the Salwen from the Mekong, which is called Lan-tsang-kiang by the Chinese and Dakio by the Thibetans. This range is very narrow, steep, and rocky, the rivers being at a height of about 6000 feet, the passes more than 12,000 feet, and the numerous snowy peaks from 18,000 to 20,000 feet above the sea. Its direction is south to north inclining a little to the west. One of the more southern snowy peaks, called Dokéla is most important, not only on account of its being a celebrated place of pilgrimage for the Thibetan devotees of eastern Thibet, but also because it may be considered as the most southern boundary of Thibet proper; the true boundary line of the Yunnan Chinese province and of the Thibetan country being only a few miles below the peak.

Some fifty years ago the boundary wall followed the ridge of the main range as far to the north as  $29^{\circ} 20'$  N. Lat., but owing to the encroaching propensities of the Thibetan government, to the weakness of the Bathang chief, and perhaps to the wickedness of some Chinese official, the Thibetans took possession of the eastern declivity of the mountain from the  $28^{\circ} 30'$  up to  $29^{\circ} 20'$ , so that the Mekong itself becomes the frontier. We must, however, except the two villages of Kiata and Dachu situated at  $29^{\circ} 02'$  on the right bank, which are kept by Bathang and China, on account of the salt-pits which, on both banks of the river, are the centre of an extensive and fruitful trade. On the left bank, the Yun-nan province reaches nearly to  $29^{\circ}$  N. Lat., and then comes the territory governed by Bathang which is part of the Se-tchuen province.

About  $29^{\circ} 20'$  the boundary crosses to the left bank of the Mekong, ascends a branch of the chain of mountains up to the main range, then, following a direction east-north-east, passes between the two villages of Bom and Lanten, the first being the last village of the Bathang territory, the second being the first of Thibet proper, both being on the high road which goes from China to Lhassa through Ta-tsien-loo, Lythang, Bathang, Kiangka, etc. This last small town which is nearly due west of Lanten is the residence of the Tiguié or Governor-General of the Kham province. Previous to the beginning of the 18th century, this province extended as far as  $102^{\circ}$  or  $103^{\circ}$  E. Long. At that time an attempted rebellion of the Thibetan Lamas having been quickly put down by a Chinese army, the consequence was, that the twenty-two Eastern Thibetan prin-

icipalities were united to the direct government, either of the Se-tchuen or of the Yun-nan province

From about the 30th degree N. Lat., the boundary of Thibet runs northwards between the Mekong and Kin-cha or Yangtse rivers; but as the steep, narrow, well-defined ranges of mountains which we encountered south are succeeded northerly by undulating table-lands the boundary is not so well traced as below. This is a perpetual cause of disputes and riots between the shepherds of Bathang and those of Thibet. However, geographically, we can draw the boundary of Thibet by following the watershed as far as 33° N. Then it turns to the north-west as far as 35° N. lat. and 95° E. Long. where it crosses the Yang-tse. From this point it takes a north-easterly direction till it reaches the mountains encircling Kookoonor, and the main range of the Kuen-len mountains. East of this boundary is, 1st, the principality of Bathang, and 2nd, more to the north, that of Dégué, both under the direct administration of Se-tchuen. West of the same limit and north of Kiang-ka, are the principalities of, 1st, Tehraya; 2nd, Tchamtou; 3rd, San-che-kieou-tso; 4th, Réoukhié; 5th, Nongkine. *By right* these five principalities do not belong to Thibet proper whose civil government they do not acknowledge. They have chiefs of their own under the direct superintendence of the third Chinese ambassador residing at Lhasa. It would have been nothing but just, if from the 30th degree N. Lat. I had drawn the eastern boundary of Thibet proper about two degrees longitude more to the west. However I do not regret having shown myself more generous, first, because these five principalities have not been put under the direct administration of Se-tchuen; secondly, because their real Chinese governor is residing at Lhasa; thirdly, because *in fact* the civil Thibetan government of Lhasa, being more powerful, behaves there nearly as the lion of the fable.

Before closing this note I may add that east of the eastern frontier of Thibet proper there is an area of at least four degrees of Longitude and six degrees of Latitude, which is peopled by the Thibetan race, under the direct Chinese administration. From this most certain fact, some consequences could be drawn, but as they are beyond the dominion of geography I refrain from mentioning them.

M. Desgodins concluded by saying that the real eastern boundary of Thibet proper was that which he had just given and which was indicated in the map which he had prepared. The map will be found at Plate X.

The President said that M. Desgodins had conferred a great favour on the Society by giving the results of his extensive experience in an almost unknown region, and he was sure that the information which he had laid before the Society would prove of the utmost value. In the course of his remarks, Mr. Medlicott asked—



Whether some of the Thibetan countries directly governed by China bordered on the province of Assam, to which M. Desgodins replied that such was not the case, the whole of Assam being encircled to the north and east not only by savage tribes, but also by districts directly governed by the Lhasa government, but that being part of Thibet proper they were, *ipso facto*, tributaries to the Chinese Empire.

General Walker observed that this Society had much reason to be indebted to Father Desgodins for his interesting and very valuable communication. The Father has resided for many years on the confines of Thibet in a region which is of the utmost importance from a geographical point of view, as there a breadth of not more than 4° in longitude is crossed by several rivers, running parallel to each other, which have long been known to be the highland sources of some of the greatest rivers in Asia. Up to the present time, however, there has been considerable uncertainty as regards the individual identity of the rivers in the highlands with those in the lowlands; and until Father Desgodins communicated the information he had obtained about them to the Geographical Societies of Paris and Lyons, there was not a single map in which errors more or less gross had not been committed in the assignment of their sources to the several great rivers. We are indebted to him for the information, recently corroborated by Captain Gill, that the Lou-tse-kiang river, which has been supposed to be one of the sources of the Mekong or Cambodia river, is in reality the source of the Salween river which debouches into British territory in Martaban. Thus the Salween has a course which is generally parallel to that of the Irrawaddy river below the 27th degree of latitude; but whereas the Irrawaddy is believed by most geographers to have its sources not higher than the 28th degree of latitude, the Salween has been conclusively shown by Father Desgodins to have a much higher origin, probably in Lat. 33°, and this is a discovery of great geographical importance.

During a residence of some years at Bathang in the valley of the Kincha or Yang-tse-kiang (Captain Gill's River of Golden Sand) Father Desgodins endeavoured to proceed to Lhasa, but he was unsuccessful in the attempt—as all other Europeans have been of late years. Eventually he moved to the south-west, crossing the valley of the Lan-tsang-kiang or Mekong river, into that of the Lou-tse-kiang or Salween river, in which he resided for three years, about the parallel of 25° of Latitude, and at a distance which he estimates as not exceeding 100 miles from the point where the Brahma Kund river enters upper Assam. Here he was in a very favourable position for making enquiries whether any large river flows through the region between the head of the Assam valley and the valley of the Salween river; this must be the case if the Sanpo, the great

river of Western Thibet, flows into the Irrawaddy, as was formerly supposed, and has latterly been again urged by Mr. Gordon of the Public Works Department in Burma. But the invariable reply to Father Desgodins' enquiries was that there was no such river; and this strengthens the probability that the Sanpo river is one with the Brahmaputra, as has for many years been believed by the generality of geographers, and is in accordance with the latest information obtained by the Trans-Himalayan explorers of the Indian Survey Department.

M. Desgodins then gave some explanations on the point that General Walker had raised as to the great probability of the Tsangpo not being the upper course of the Irrawaddy but that of the Bramaputra: in this opinion M. Desgodins fully coincided.

The reasons which he put forward are these. He had been told that the district of Dza-yul is a rather rich agricultural country: therefore a low one, very likely not exceeding 6,000 feet above the level of the sea. That at the south of this district of Dza-yul there is the district of Djrouba a high uncultivated tableland peopled by shepherds living in tents. If the Tsangpo flowed through Dza-yul (and it could not flow elsewhere) to the Irrawaddy, it would be necessary, for it either to ascend this high tableland, which is absurd, or to flow through an immense cutting or ravine of three or four thousand feet. Though he has had many opportunities of wandering through tablelands in many other places, he has never observed such a feature of plateaux.

2. If there were two high tablelands divided by a large river, this could not escape the notice of the natives of the country. Pagans as well as Christians, who had gone for purposes of trade to Dza-yul, unanimously say there is no large river. Amongst our first Christians were men belonging to several savage tribes of upper Burma. They had been made prisoners of war and sold as slaves to the Thibetans before coming to the missionaries. They also unanimously say that in their own country there are no large rivers. One of them taken prisoner in Assam by the Abords had to cross their country along a large river, which he called Dibong or Dibong (M. Desgodins did not remember exactly which). He thought that it was the Tsangpo flowing through stupendous and fearful precipices.

3. A Lama had travelled all over Thibet on a pilgrimage. He went to worship the sacred lake Tsomapang (Mansarowar of our maps), where the Tsangpo has its source, descended the river as far as Lhasa where he lived for many years, then coming down to Bathang his native country, where he was met by M. Desgodins, he followed again the lower part of the Tsangpo as far as a savage tribe called by Thibetans Lhopa (inhabitants of the south) or Lho-kha-tchra (tattooed inhabitants of the south.) From what he stated about this tribe, M. Desgodins has no doubt they are the

Abords. There the Tsangpo takes a southerly direction, through an awful split of the hills where it flows overhung by fearful perpendicular rocks. This Lama was told by people of the country, that after flowing for some distance through this precipitous channel, the whole of the Tsangpo ended in an immense waterfall, which was so deep that looking from the top to the bottom makes a man's head giddy at once. This Lama held out most stubbornly against M. Desgodins' objections, and maintained that the Tsangpo flowed to the south not to the east, not towards Dza-yul which he knew well, but through the Abord tribe. M. Desgodins observed that all this information from the natives had reference to the country below and above the  $28^{\circ}$  N. Lat. where the maps generally indicate the sources of the Irrawaddy. M. Desgodins believes this is correct if the native information is reliable, because about this parallel there is a high tableland which separates small rivers to the south and to the north. M. Desgodins thinks it is a water-shed of the Irrawaddy and of a small branch of the upper Bramaputra.

4. In answering the objection that the body of water of the Irrawaddy is so great (at least as great as that of the Salwen) that its sources must be much higher up to the north than the  $28^{\circ}$  lat. N., M. Desgodins remarked, 1st, that the Irrawaddy beginning by  $28^{\circ}$  lat. N. is entirely in the zone of very rainy countries, 2nd, that the melting of snow in Tibet sends very little water to the great rivers Salwen, Me'kong and Yangtse. The snow melts at the end of April or beginning of May, at which time the rising of the rivers is only beginning, the great rising commencing only in July and August with the rains. 3rd, M. Desgodins remarked that Capt. Gill, who had pointed out to him the very same objection, acknowledges, 1st, that the Irrawaddy is indeed very large but not very deep, 2nd, that the small river which he followed from Tenyue to Bahmo had suddenly swollen so much in consequence of some rainy days that he understood how the Irrawaddy could have its source only in  $28^{\circ}$  lat. N., the whole surrounding country being situated in the zone of tropical rains. This observation of Capt. Gill's M. Desgodins could corroborate by pointing out some villages at about  $28^{\circ}$  lat. N. on the banks of the Salwen and of the Mékong, which are at the very limit between dry and damp countries. There is no middle zone. The cause of this phenomenon is apparently owing to the snowy ranges which, from the  $25^{\circ}$  lat. N., run in a northerly direction, and stop the rains coming from the Bay of Bengal.

At the conclusion of M. Desgodins' remarks, the President said he had much pleasure in conveying to him the thanks of the Society for the very valuable paper with which he had favoured them that evening.

8. *On the Lepidopterous Genus Æmona, with the Description of a new species.*—By J. WOOD-MASON.

4. *Contributions to Indian Malacology, No. XII.*—By W. T. BLANFORD, F. R. S.

5. *Report on a visit to Nongyang Lake, on the Burmese Frontier, February 1879.*—By S. E. PEAL.

6. *List of Mollusca from the Hills between Mari and Thandiani.*—By W. THEOBALD, Dy. Supdt., Geological Survey of India.

These papers will be published in the Journal, Part II.

### LIBRARY.

The following additions have been made to the Library since the meeting held in November last.

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*presented by the respective Societies and Editors.*

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# I N D E X

TO

PROCEEDINGS, ASIATIC SOCIETY OF BENGAL,

FOR 1880.

	<i>Page</i>
Actinometer, Balfour Stewart's ... ..	6
<i>Æmona</i> ... ..	203
„ <i>Amathusia</i> ... ..	123
„ <i>Peali</i> ... ..	123
Afghan helmet, exhibition of ... ..	171
Afghanistan, geological specimens from ... ..	3
Afghans found along the route of the Tal Chotiali Field Force ... ..	57
Agni-mitra, coins of ... ..	7
Agni Purána, completion of ... ..	26
Abichhatra, coins from ... ..	7
Ahmad (Moulvie Dilawar Hasein), elected an Ordinary Member ... ..	195
Ahmad (Kabiruddin), member of Philological Committee ... ..	32
Ain-i-Akbari, Translation of 2nd volume of ... ..	22, 88
Aitchison (Dr. J. E. T.), geological specimens sent by... ..	3
„ „ rat sent by ... ..	173
„ „ specimens of rocksalt sent by ... ..	123
Aja Varmma, coin of ... ..	71
Akbar, coins of ... ..	183
Akbarnamah, progress of ... ..	26, 88
Ala-uddin Muhammad Shah, coin of ... ..	89
Amendments to Rules ... ..	87, 114
Andamans, butterflies from the ... ..	102, 123, 124
Annual Meeting ... ..	21
„ Report ... ..	21
Antiochus, coins of ... ..	117, 170
Apastamba Sutra ... ..	170
<i>Apatura</i> , description of an Insect belonging to the Genus ... ..	80
<i>Aphelandra tetragona</i> ... ..	103



	<i>Page</i>
Arakan Coins ... ..	53
Arcot, megalithic monuments in North ... ..	43
Armstrong (Dr. J.), member of Natural History Committee ... ..	52
Arsacidan dynasty, coins of the ... ..	5
Aryans, photographs of ... ..	140
Asha Varma, coin of ... ..	71
Asia, on the Barometer in ... ..	12
Assam, List of Earthquakes during 1879 in ... ..	63
Australia, on the Barometer in ... ..	12
Ayumitra, coins of ... ..	...8, 43, 71
Bactrian coins ... ..	...115, 119
Bairát ... ..	158
Baloochi Poems, translation of ... ..	57, 183
Banerjea (Rev. K. M.), member of Philological Committee ... ..	51
Baness (J. F.), removed from Member List under Rules 37 and 38 ... ..	140
Barhal, or Blue Sheep of Thibet ... ..	42
Barker (Dr. R. A.), compounds for future subscriptions ... ..	41
Barton, inscription sent by Mr. ... ..	140
Barometer in Asia and Australia, on the ... ..	12
Bateman (W. E.), resignation of Asst. Secretaryship by ... ..	26
Beames (J.), member of Philological Committee ... ..	51
Berkeley (Col.), coins sent by ... ..	171
Beverley (H.), member of Finance and Library Committees ... ..	51
"    "    re-elected Treasurer and Member of Council ... ..	40
"    "    resignation of Treasurership ... ..	88
Bhadraghosa, coins of ... ..	7
Bhámati, progress of ... ..	27
Bhanu-mitra, coins of ... ..	7
Bbárhát, inscription from ... ..	58
Bhootea weapons ... ..	105
Bhumi-mitra, coins of ... ..	7
Bibliotheca Indica Series, report on ... ..	26
"    "    "    works sanctioned for publication in the ... ..	88, 170
Biddulph (Major J.), specimen of verdeantique marble sent by ... ..	4
Bion (W. A.), appointed Asst. Secretary ... ..	26
Biswan (Raja of), elected an Ordinary Member ... ..	99
Blackburn (J.), appointed Scrutineer ... ..	114
Black Yajur Veda ... ..	170
Blanford (H. F.), exhibition of a Balfour Stewart's Actinometer ... ..	6
"    "    member of Library and Physical Science Committees ... ..	51, 52





*Index.*

211

	<i>Page</i>
Dharma-Chandra, coins of ... ..	54
Diodotus, coin of ... ..	116
Doms ... ..	57
Douglas (J. C.), appointed Auditor ... ..	40
"    "    appointed Treasurer and member of Council ... ..	88
"    "    member of Finance, Library and Physical Science Committees ... ..	51, 52
"    "    on the use of Silver Films in instruments of the Camera Lucida class ... ..	73
Doxey (Rev. J. S.), elected an Ordinary Member ... ..	99
Dynamo-electric machine for telegraphic purposes, on the use of a... ..	173
Earthquakes in Assam during 1879 ... ..	63
Eetvelde (É. van), appointed Scrutineer ... ..	21
Electrical Radiometers ... ..	91
Elfstenor in Sweden ... ..	89
Elf-cups ... ..	89, 196
Elias (Ney), elected an Ordinary Member ... ..	70
Eliot (J.), member of Library and Physical Science Committees... ..	51, 52
Estimate of Income and Expenditure for 1880 ... ..	70
Eucratides, coins of ... ..	170
Euthydemus, coins of ... ..	116, 170
Fa Hian ... ..	141
Fatehpur district, coins from ... ..	102
Fedden (F.), member of Physical Science Committee ... ..	52
Feistmantel (Dr. O.), member of Library, Natural History and Physical Science Committees ... ..	51, 52
Fiddian (W.), elected an Ordinary Member ... ..	70
Field (Hon. C. D.), withdrawal of ... ..	70
Finance Committee ... ..	51
"    "    report on ... ..	23
Gajapati (Ananda Ram), elected an Ordinary member ... ..	70
Ganjai-Konḍapuram, on the Great Siva Temple of ... ..	11
Garbe (Dr. R.), edition of the Apastamba Sutra by ... ..	170
Garo weapons ... ..	105
Gennoe (T. A. M.), impression of medal sent by ... ..	100, 172
Geological specimens from Afghanistan ... ..	3
Ghosha (P. C.) member of Library and Philological Committees ... ..	51, 52
"    "    re-elected member of Council ... ..	40
Gibbs (Hon. J.), elected an Ordinary Member ... ..	139
Girdlestone (C.), on Mr. Gennoe's medal ... ..	172
Gobhilya Grihya Sutra, progress of ... ..	27



	<i>Page</i>
Holroyd (Major W. R. M.), withdrawal cancelled	50
Hume (A. O.) member of Natural History Committee	52
Hun Dinára ...	119
Hurdui, celt from ...	70
Hverki, coins of ...	118
Indian Land Mollusca ...	183
Indian Museum, report on ...	23
"    "    coins from ...	53
Indian Prehistoric Tumuli ...	89
Indo-Aryans, photograph of ...	171
Indo-Scythian coins ...	118
Indra-Mitra, coins of ...	7
Inscriptions ...	10, 54, 55, 58, 72, 76, 138, 139, 172
Isabah, continuation of ...	88
Jackson (W. G.), elected an Ordinary Member	195
Jarrad (Lieut. F. W.), member of Natural History Committee	52
Jarrett (Major H. S.), member of Philological Committee	52
"    "    note on an inscription from Koh Inám	72
"    "    on an inscription from Kashmir	54
"    "    translator of the Tarikh-ul-Khulfa	28
Jaya Mitra, coin of ...	71
Jellalabad, coins from near ...	170
Johnstone (Lieut. W. H.), elected an Ordinary Member	2
Johnston (W. P.) elected an Ordinary Member	114
"    "    election cancelled	196
"    "    on testing Telegraph Cables	92
Junapanee, cup-marks in ...	90
Kachar, sovereigns of ...	144
Kadu, coins of ...	54
Kamuda Sena, coin of ...	71
Kanerki, coins of ...	118
Kangra, on the Coins of the Maharajas of ...	12
Kaontsouzshen, coins of ...	102
Kashmir, inscription from ...	54
Katantra, completion of ...	27
Kathá Sarit Ságara, translation of ...	29, 88
Kathaka Grihya Sútra ...	88
Khusrau Malik, coins of ...	183
Kiakung, coins of ...	102
Kienlong, coins of ...	102
King (W.), reply to Prof. Schaffhausen's ethnological queries sent by	2

	<i>Page</i>
King (Dr. G.), member of Natural History Committee	52
Kirton (Dr.), elected an Ordinary Member	196
Kisch (H.), elected an Ordinary Member	2
Koh Inám, inscription from	72
Kota, coin of	119
Kulu-Eli, inscription in	10
Ladakh Mammals	11
Lafont (Rev. E.), on Crookes' Electrical Radiometers	91
<i>Lagomys rufescens</i>	173
Lájasa, coin of	71
Lambe (W.), elected an Ordinary Member	139
Land Mollusca	183
Langur Monkeys	55
Laranga, coin of	71
Larata, coin of	71
Latif Khan Bahadur (Moulvie Abdul), member of Philological Committee	52
Lees (R. O.), elected an Ordinary Member	169
Leitner (Dr. G.), photographs of Aryans and Non-Aryans sent by	140, 171
Lepcha Knife	105
<i>Lepidoptera</i>	184
"    (Diurnal), from the Andamans	124
Lewis (Dr. T. R.), elected member of Council	40
"    "    member of Library and Natural History Committees	51, 52
"    "    resignation as member of Council and Trustee of the Indian Museum	140
Lewis (Rev. A.), elected an Ordinary Member	114
Library, additions to the	13, 44, 64, 81, 94, 106, 125, 158, 185, 203
"    Committee	51
"    report on the	24
<i>Limenitis Danava</i> , female of	123
London Agency, report on the	23
Loris	57
Lunka Island, inscription from	54
Luttman-Johnson (H.), facsimiles of copper-plate inscriptions sent by	141
Lydekker (R.), a History of the Fossil Vertebrata of India by	42
"    "    member of Natural History and Physical Science Committees	52
"    "    on some Ladakh Mammals	11

	<i>Page</i>
Lydekker (R), on the Dentition of Rhinoceros ...	103
"    "    on the Zoological position of the Barhal ...	42
McCann (Dr. H. W.) elected an Ordinary Member ...	196
MacDonald (J.), elected an Ordinary Member ...	99
MacDonald (J. C.), withdrawal of ...	87
MacLeod (R. H.), elected an Ordinary Member ...	86
Maghazi-el-Waqidi ...	88
Mahábhārata ...	157
Mahana, inscription from Keoti Kunda on the river ...	55
Maha Satama, coin of ...	71
Maitráyani Sambhita ...	29, 88, 170
Malacology, Indian ...	203
Maliah (Ramesvar), elected an Ordinary Member ...	50
Mammals from Ladakh ...	11
Mandalik (Rao Sahib Visvanath), elected an Ordinary Member ...	86
<i>Mantodea</i> ...	103
Maphaba Varma, coin of ...	71
Mari and Thandiani, mollusca from between ...	203
Markham (A. M.), inscriptions sent by ...	55, 72
Marshall (Capt. G. F. L.), member of Natural History Committee ...	52
Mauritius, coin of ...	5
Medlicott (H. B.), exhibition of Geological specimens from Afghanistan ...	3
"    "    exhibition of specimen of Rock salt from Afghanistan ...	123
"    "    remarks on M. Desgodins' paper ...	199
"    "    remarks on 2nd vol. of Dr. Mitra's "Orissa" ...	86
"    "    re-elected President and member of Council ...	40
Meeting, Monthly General ... 1, 40, 49, 69, 85, 99, 113, 139, 167, 195	
Megalithic monuments in north Arcot ...	43
Members, election of ... 2, 41, 50, 70, 86, 99, 114, 139, 169, 195	
Mīmāṃsa Darsana, progress of ...	27
Mitra coins ...	7, 43, 92
Mitra (Dr. R. L.), exhibition of Chinese inscription from Buddha Gaya ...	140
"    "    exhibition of some very old palm-leaf MSS. and some ancient coins ...	4
"    "    member of Finance, Library, Philological and Coins Committees ...	51, 52, 53
"    "    note on Arakan coins ...	53



	<i>Page</i>
Mitra (Dr. R. L.) on an inscription from Bhárhath ...	58
„ „ on coins, &c., sent by Lieut. Temple ...	89
„ „ on coins sent by Mr. V. A. Smith ...	119
„ „ on copper-plate inscriptions from Sylhet ...	141
„ „ on inscriptions from Buddha Gaya ...	76, 172
„ „ on a MS. of the Setubandha ...	119
„ „ on medal sent by Mr. T. A. M. Gennoe ...	100
„ „ re-elected Vice-President and member of Council ...	40
„ „ remarks on coins of the Mitra dynasty ...	8
„ „ remarks on paper on Calcutta water supplies ...	155
„ „ remarks on paper on identity of Upello and Upa- plava ...	157
Mollusca ...	183
„ from between Mari and Thandiani ...	203
„ new species of Brackish-water ...	196
Monoliths in Sweden ...	90
Moore and Hewitson's Lepidoptera ...	2, 24
<i>Morphidæ</i> ...	123
Morris (Hon. G. G.), withdrawal of ...	100
Mullick (Benod Behary), elected an Ordinary Member ...	169
Mussoorie, butterflies from ...	123
Naga weapons ...	105
Nag (Sib Chunder), elected an Ordinary Member ...	169
Napier (J. R.), elected an Ordinary Member ...	195
Natural History Committee ...	52
<i>Neptis</i> , 2 specimens of a large species of ...	123
„ <i>zaida</i> , female of ...	123
Nevill (G.), member of Library and Natural History Committees ...	51, 52
„ „ on new species of Brackish-water Mollusca ...	196
Newcomb (Prof.), "Astronomical Papers for the use of the American Nautical Almanac" by ...	41
Nicéville (L. de), list of Diurnal Lepidoptera from the Andamans ...	124
„ „ on a Lepidopterous Insect belonging to the Genus <i>Apatura</i> ...	80
„ „ on Butterflies from the Andamans ...	102
Nicholson (R. W.) elected an Ordinary Member ...	169
Nirmali ...	156
Nirukta ...	88
Nongyang Lake, visit to ...	203
Obituary ...	22

	<i>Page</i>
O'Brien (E.), withdrawal of	169
Odgoras, coin of	116
Officers, election of	40
O'Kinealy (Hon. J.), member of Philological and Physical Science Committees	51, 52
Oldham (R. D.), elected an Ordinary Member	196
Palæolithic celt from Thandiani	175
Pali Inscription from Bhārhat	58
Pandia (Pandit M. V.), compounds for his future subscriptions	169
"    "    elected an Ordinary Member	139
Pandit (Prannath), member of Library and Philological Committees	51, 52
Panjab, celt from the	175
<i>Papilio antiphates</i>	102
" <i>Dravidarum</i>	184
"    from South India	184, 196
" <i>læstrigonum</i>	102
" <i>mahadeva</i>	184
" <i>morgani</i>	196
"    new species of	102
Páre-Angúri, rock-salt from near	123
Pargiter (F. E.), elected an Ordinary Member	2
Parry (J. W.), elected an Ordinary Member	2
Parry (R.), withdrawal of	2
Pathan Kings, chronicles of the	183
Patron of the Society, Lord Ripon accepts office of	140
Peal (S. E.), butterflies sent by	123
"    "    drawings of hailstones by	103
"    "    member of Natural History Committee	52
"    "    on a visit to Nongyang lake	203
Pearse (Maj.-Gen. G. G.), on Bactrian and South Indian coins	115
Pedler (A.), appointed General Secretary, member of Council and Trustee of the Indian Museum	88
"    "    member of Library and Physical Science Committees	51, 52
"    "    on the Calcutta water supplies	153
Pertinax, coin of	171
Phaguni-mitra, coins of	7
Phayre Museum, coins from	53
Philological Committee	51
Physical Science Committee	52
Porter (W.), removed from Member List under Rules 37 and 38...	140

	<i>Page</i>
Prakrit Grammar, exhibition of ... ..	100
Prasad (Raja Siva), elected an Ordinary Member ... ..	139
"    "    election cancelled ... ..	196
Prasad Sing (Thakur Garuradhawaya), raja of Biswan, elected an Ordinary Member ... ..	99
Pravarasena ... ..	119
Prehistoric Tumuli, Indian ... ..	89
Presentations ... 1, 40, 49, 69, 85, 99, 118, 139, 167	167
President's Address ... ..	85
Prithirāja Rasau, progress of ... ..	27
<i>Pseudois</i> ... ..	42
Publications, report on ... ..	24
<i>Pulmonifera</i> ... ..	183
Pughe (Robertson), weapons sent by ... ..	106
Radiometers, Crookes' electrical ... ..	91
Rai (Bipina Chandra), elected an Ordinary Member ... ..	70
Rāmasetu-vivarana ... ..	120
Rama Tunka, a gold ... ..	115
Ramnagar, coins from ... ..	7
Ravanabadha-tikā ... ..	120
Ravanavaho ... ..	120
Raya Chaudhuri (Kshiroda Chandra), elected an Ordinary Member	169
Raye (Dr. D. O'C.), withdrawal of ... ..	169
Rewah, coins from ... ..	118, 171
Reynolds (H. W. W.), elected an Ordinary Member ... ..	139
Rhinoceros, on the dentition of ... ..	103
Richards (Dr. V.), withdrawal of ... ..	70
Rind Balochis ... ..	57
Ripon (Lord), Patron of the Society ... ..	140
Rishikesh (Pandit), on the identity of Upello and Upaplava ... ..	157
Rivett-Carnac (H.), member of the Philological and Coins Com- mittees ... ..	52, 53
"    "    Mitra coins sent by ... ..	7
"    "    on a celt from Hurdui ... ..	70
"    "    on Buddhist coins ... ..	71
"    "    on clay discs, spindle whorls, &c. ... ..	115
"    "    on clay discs and votive seals ... ..	104
"    "    on coins found by Col. Berkeley ... ..	118
"    "    on coins found near the Grand Trunk Road ... ..	102
"    "    on coins from near Jellalabad and Rewah ... ..	170
"    "    on coins of the Sunga Dynasty ... ..	71

	<i>Page</i>
Rivett-Carnac (H.), on letter from Chevalier Hans Hildebrandt ...	89
Bodgers (C. J.), on coins supplementary to Thomas's "Chronicles of the Pathán kings" ...	57, 183
"    "    on copper coins of Akbar ...	183
"    "    on the coins of the Maharajas of Kangra ...	12
Roepstorff (A. de), Butterflies sent by ...	123
"    "    Diurnal Lepidoptera collected by ...	124
Roman coins ...	118, 171
Rudradatta, commentary of ...	170
Rules, amendments to ...	87, 114
Safed Koh, <i>Lagomys rufescens</i> from ...	173
Sage (E. M.), elected an Ordinary Member ...	169
Sankisa, clay discs, &c., from ...	104
Sanpo River ...	200
Sassanians, coins of the ...	5
Satya-mitra, coin of ...	71
Schaffhausen's (Prof.) ethnological queries ...	2
Schroeder (Dr. L.), editor of the <i>Máitrayani Samhita</i> ...	29, 170
Schlich (Dr. W.), member of Natural History Committee ...	52
Sconce (Lt.-Col. J.), appointed Scrutineer ...	21
Scott (Mr.), geological specimens sent by ...	3
Schwendler (L.), elected member of Council ...	40
"    "    member of Natural History Committee ...	52
"    "    on the telephone ...	93
"    "    on the use of a dynamo-electric machine for telegraphic purposes ...	173
"    "    zoological notes by ...	55
Secretary's Office, report on ...	25
<i>Semnopithecus entellus</i> ...	55
Septimus, coin of ...	171
Setubandha, MS. of the ...	119
Setuchandriká ...	120
Setupradipa ...	120
Setusarani ...	119
Sherring (Rev. M. A.), member of Coins Committee ...	53
Sher Shah, coin of ...	119
Sibsagar, butterflies from ...	123
Sikandar Shah Behlol, coin of ...	89
Silver films ...	73
Sircár (Dr. M. L.), member of Library and Philological Com- mittees ...	51

	<i>Page</i>
Sircár (Dr. M. L.) translator of the Charaka	29
Siva Temple of Ganjai-Konḍapuram	11
Smith (V. A.), on the History of Bundelkhand	175
"    "    coins sent by	118
Snake-worship in Sweden	91
Societies, &c., exchanging publications, list of	29
Sonthal weapons	105
Soter Megas	119
South Indian coins	115
Spain, coin of	5
Spindle whorls	104
Srauta Sûtras	170
Srayan-mitra, coins of	7
Stewart (Major), geological specimens sent by	4
Stokes (Hon. Whitley), member of Library and Philological Com- mittees	51
<i>Strichnos potatorum</i>	156
Stubbs (Col. F. W.), member of Coins Committee	53
Sturt (Lieut. R. R. N.), elected an Ordinary Member	169
Sûgáta Janapya	71
Sultanpur, inscription at	10
Sunga dynasty, coins of	...7, 43, 71
Sun-spot cycle	12
Surya-mitra, coins of	8, 71
Sûryaprajñápti	124
Svastika	72
Swedish Remains	89
Swynnerton (Rev. C.), elected an Ordinary Member	169
"    "    on a sculptured stone pendant	196
"    "    on a palæolithic celt from Thandiani	175
Sykes (J. G. W.), elected an Ordinary Member	99
Symbolical coins of Arakan	53
Tabaqát-i Násirí, progress of	26
Taittiriya Samhitá, progress of	27
Tal Chotiali Field Force, on Afghans found along the route of the	57
Tanner (Major), geological specimens sent by	3
Tarikh-ul-Khulfa	28, 88
Tawney (C. H.) member of Library and Philological Committees	51
"    "    re-elected Vice-President and member of Council	40
"    "    translator of the Kathá Sarit Ságara	29

# *Index.*

221

	<i>Page</i>
Taylor (Com. A. D.), member of Physical Science Committee ...	52
Telephone ...	93
Temple (Lieut. R. C.), coins, &c., sent by ...	89
"    "    on an Afghan helmet ...	171
"    "    on Afghans found along the route of the Tal Chotiali Field Force ...	57
"    "    on an Inscription at Sultanpur ...	10
Templeton (C.), butterflies sent by ...	123
Ten-chandra, coins of ...	53
Tennant (Col. J. F.), member of Library, Physical Science and Coins Committees ...	51, 52, 53
"    "    on Newcomb's "Astronomical Papers" ...	41
"    "    on the verification of weights ...	42
Thandiani, celt from ...	175
"    mollusca from between Mari and ...	203
Theobald (W.), on mollusca from between Mari and Thandiani ...	203
Thibaut (Dr. G.), member of Philological Committee ...	51
"    "    on the Súrýaprajñápti ...	124
Thibet, Blue Sheep of ...	42
"    on the eastern frontier of ...	196
Thomas' "Chronicles of the Paṭhán kings," coins supplementary to ...	57, 183
Travancore, <i>trochalopterum</i> from ...	184
<i>Trochalopterum</i> , from Travancore ...	184
" <i>fairbanki</i> ...	184
" <i>meridionale</i> ...	184
Tumuli, Indian prehistoric ...	89
Tufnell (Lieut. R. C.), elected an Ordinary Member ...	50
Upaplava, on the identity of Upello with ...	157
Upello with Upaplava, on the identity of ...	157
Vaisákha Deva, coins of ...	71
Vaisáli dynasty, coins of the ...	53
Varaha coin ...	119
Varmma, coins of ...	71
Vayu Purána, progress of ...	27
Viceroy, Patron of the Society ...	140
Vijaya, coins of ...	54
Vijaya-mitra, coin of ...	71
Vijayanuggur dynasty, coins of ...	115
Viráta ...	157
Vishnu Súra ...	88
Vizianagram (Raja of), elected an Ordinary Member ...	70

	<i>Page</i>
Votive seals ... ..	104
Waldie (D.), appointed Scrutineer ... ..	114
"    " member of Natural History and Physical Science Committees ... ..	52
"    " re-elected member of Council ... ..	40
"    " remarks on paper on Calcutta water supplies ... ..	157
Walker (Maj.-Gen. J. T.), member of Library and Physical Science Committees ... ..	51, 52
"    " re-elected member of Council ... ..	40
"    " remarks on M. Desgodins' paper ... ..	200
Waller (Dr. W. K.), member of Library Committee ... ..	51
Waterhouse (Major J.), letters regarding the Blochmann Memorial from ... ..	170
Water supplies of Calcutta ... ..	153
Webb (W. T.), withdrawal of ... ..	196
Weights, verification of standard ... ..	42
Westland (J.), appointed Auditor ... ..	40
"    " member of Finance Committee ... ..	51
"    " re-elected Vice-President and member of Council ... ..	40
"    " remarks on an Afghan helmet sent by Lieut. Temple ... ..	171
White (Hon. J. S.), withdrawal of ... ..	114
Wilson (Hon. A.), elected an Ordinary Member ... ..	41
Wood-Mason (J.), exhibition of Butterflies from the Andamans ... ..	102
"    " exhibition of Butterflies from the Andamans, Mussoorie and Sibsagar ... ..	123
"    " exhibition of rat from the Safed Koh Range ... ..	178
"    " exhibition of specimens of <i>Papilio</i> from South India ... ..	196
"    " list of Diurnal Lepidoptera from the Andamans ... ..	124
"    " on <i>Papilio</i> from South India ... ..	184
"    " on the female of <i>Hebomoia Roepstorffii</i> ... ..	184
"    " on the Lepidopterous genus <i>Amona</i> ... ..	203
"    " on the nectar-glands of <i>Aphelandra tetragona</i> ... ..	103
"    " on the species of <i>Choeradodis</i> ... ..	103
"    " re-elected Natural History Secretary and mem- ber of Council ... ..	40, 41
Woolar Lake, inscription from ... ..	54
Yusafzai valley, fragment of sculpture from ... ..	196
<i>Zonitidæ</i> ... ..	184
Zoological notes ... ..	55

[APPENDIX.]

LIST OF MEMBERS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
ON THE 31ST DECEMBER 1879.



## LIST OF ORDINARY MEMBERS.

~~~~~  
R. = Resident. N. R. = Non-Resident. N. S. = Non-Subscribing.  
L. M. = Life Members. F. M. = Foreign Members.  
~~~~~

N. B.—Members who have changed their residence since this list was drawn up, are requested to give intimation of such a change to the *Secretaries*, in order that the necessary alteration may be made in the subsequent edition. Errors or omissions in the following list should also be communicated to the *Secretaries*.

Members who are about to leave India and do not intend to return, are particularly requested to notify to the *Secretaries*, whether it be their desire to continue as members of the Society, otherwise, in accordance with Rule 40 of the Bye-laws, their names will be removed from the list at the expiration of three years from the time of their leaving India.

Date of Election.		
1860 Dec. 5.	R.	Abdul-Latif, Khán Bahádur, Maulawí. <i>Calcutta</i> .
1868 Sept. 2.	N.R.	Adam, R. M., Depy. Commissioner, Salt Revenue. <i>Madras</i> .
1878 Mar. 6.	R.	Adharlal Sen, B. A., Babu. <i>Calcutta</i> .
1860 July 4.	N.R.	Ahmad Khán Bahádur, Sayyid, c. s. i. <i>Aligarh</i> .
1872 April 3.	N.R.	Ahsan-ullah, Nawáb. <i>Dacca</i> .
1860 April 4.	N.R.	Aitchison, J. E. T., M. D., Surgeon-Major, 29th N. I. <i>Talagong</i> .
1871 June 7.	N.R.	Alexander, J. W., Mayo College. <i>Ajmere, Rajpootana</i> .
1878 Mar. 6.	N.R.	Allen, G. W., c. i. e, <i>Pioneer Press, Allahabad</i> .
1874 June 3.	N.S.	Amir Ali, Sayyid, Barrister at Law.
1865 Jan. 11.	F.M.	Anderson, John, M. D., F. R. S., F. L. S., Superintendent, Indian Museum. <i>Europe</i> .
1875 June 2.	R.	Apcar, J. G., Barrister at Law. <i>Calcutta</i> .
1875 Feb. 3.	N.R.	Armstrong, J., Surgeon, Beng. Army. Marine Survey Department.
1877 June 6.	R.	Arnold, Henry Kerchever Walter. <i>Calcutta</i> .
1877 July 4.	R.	Ashgar Ali Khán, Nawáb Diler Jang Bahadúr, c. s. i., <i>Calcutta</i> .
1871 Sept. 6.	N.R.	Atkinson, Edwin Felix Thomas, B. A., c. s., Offg. Aoct. General, N. W. P. <i>Allahabad</i> .
1869 Feb. 3.	N.R.	Attar Singh Bahádur, Sirdár, c. i. e., M. U. F., Chief of Bhadour. <i>Ludiana</i> .
1870 Feb. 2.	N.R.	Baden-Powell, Baden Henry, c. s., Conservator of Forests. <i>Lahore</i> .
1873 Aug. 6.	N.R.	Badgley, Major William Francis, s. c., Offg. Deputy Superintendent of Surveys. <i>Shillong</i> .
1862 Feb. 5.	R.	Baisák, Bábu Gaurdás, Depy. Magistrate. <i>Burisal</i> .
1865 Nov. 7.	F.M.	Ball, Valentine, M. A., F. G. S., Geol. Survey of India. <i>Geological Survey Office. Europe</i> .

Date of Election.		
1860 Nov. 1.	R.	Banerjea, Rev. Kristno Mohun, LL. D. <i>Calcutta.</i>
1876 June 7.	R.	Baness, John Frederick, Chief Draftsman, Surveyor General's Office. <i>Calcutta.</i>
1878 July 3.	N.R.	Barbe, H. L. St. c. s. <i>Indore.</i>
1869 Dec. 1.	N.R.	Barker, R. A., M. A., Civil Surgeon. <i>Bogra.</i>
1879 Aug. 28	N.R.	Barkley, D. G., M. A., c. s. <i>Jullundur.</i>
1860 July 4.	R.	Batten, George Henry Maxwell, c.s., Barrister at Law. <i>Calcutta.</i>
1859 May 4.	L.M.	Bayley, Edward Clive, The Hon. Sir, B. C. S., K. C. S. I., C. I. E. <i>Europe.</i>
1878 June 5.	N.R.	Bayley, C. S., c. s. <i>Raneegunge.</i>
1873 Feb. 5.	R.	Bayne, R. R., M. R. I. B. A., Draughtsman, Chief Engineer's Office, E. I. Railway. <i>Calcutta.</i>
1864 Sept. 7.	N.R.	Beames, John, B.C.S., Magistrate and Collector. <i>Hughli.</i>
1878 Sept. 25.	N.R.	Beighton, T. D., c. s., District and Sessions Judge. <i>Beerbhoom.</i>
1862 Oct. 8.	R.	Bernard, Charles Edward, c. s., Secy. to the Govt. of India, Home, Rev. and Agril. Department. <i>Calcutta.</i>
1872 Aug. 7.	R.	Beverley, Henry, M. A., c. s., Offg. District and Sessions Judge, 24-Pergunnahs. <i>Calcutta.</i>
1876 Nov. 15.	N.R.	Beveridge, Henry, c. s., District and Sessions Judge. <i>Patna.</i>
1878 Oct. 4.	R.	Bhakta, Babu Krishna Gopal. <i>Calcutta.</i>
1879 Mar. 5.	N.R.	Biddulph, Major J., B. S. C., Officer on special duty. <i>Gilgit, Kashmir.</i>
1875 July 7.	N.R.	Black, F. C., Asst. Engineer. <i>Hamirpur, N. W. P.</i>
1873 Dec. 3.	R.	Blackburn, J., Manager, Oriental Gas Company. <i>Calcutta.</i>
1857 Mar. 4.	L.M.	Blanford, H. F., A. B. S. M., F. G. S., Meteorological Reporter, Govt. of India. <i>Calcutta.</i>
1859 Aug. 3.	F.M.	Blanford, W. T., A. B. S. M., F. R. S., F. G. S., Depy. Supdt., Geological Survey of India. <i>Europe.</i>
1873 April 2.	N.R.	Blissett, T., Superintendent, Telegraph Stores. <i>Nagpur.</i>
1879 Aug. 28.	R.	Blyth, W. D., B.A., c.s., Magte., 24-Pergunnahs. <i>Calcutta.</i>
1877 May 2.	R.	Bourdillon, James Austin, c. s., Offg. Inspector General of Registration. <i>Calcutta.</i>
1876 Nov. 15.	N.S.	Bowie, Major M. M. <i>Europe.</i>
1868 Jan. 15.	N.S.	Boxwell, John, c. s., Offg. Deputy Commissioner. <i>Europe.</i>
1876 May 4.	N.R.	Bradshaw, Surgeon-Major A. F., Surgeon to the Commander-in-Chief. <i>Simla.</i>
1860 Mar. 7.	R.	Brandis, Dietrich, PH. D., Inspector General of Forests. <i>Calcutta.</i>
1872 June 5.	N.R.	Brooks, W. E., c. e., Supdg. Engineer, E. I. Railway. <i>Muddapur.</i>
1879 Jan. 8.	R.	Browne, J. F., c. s., M. R. A. S., Offg. District and Sessions Judge, 24-Pergunnahs. <i>Calcutta.</i>
1866 Nov. 7.	N.R.	Browne, Col. Horace Albert, Commissioner of Pegu. <i>Rangoon.</i>

Date of Election.		
1871 Sept. 6.	N.R.	Buckle, H., Deputy Commissioner. <i>Toungthoo, Burmah.</i>
1879 Mar. 5.	R.	Buckland, C. E., c. s. <i>Calcutta.</i>
1879 April 2.	R.	Calcutta, The Rt. Rev., the Lord Bishop of. <i>Calcutta.</i>
1869 Jan. 20.	N.R.	Cadell, Alan, B. A., c. s., Settlement Officer. <i>Banda.</i>
1873 Mar. 5.	R.	Cappel, A. J. L., Depy. Director General of Telegraphs. <i>Calcutta.</i>
1876 Nov. 15.	R.	Cayley, Surgeon-Major H., Surgeon, Mayo Native Hospital. <i>Calcutta.</i>
1875 April 4.	R.	Chambers, Dr. E. W. <i>Calcutta.</i>
1879 Nov. 5.	R.	Charles, T. E., M. D., F. R. C. P. <i>Calcutta.</i>
1861 Mar. 1.	N.R.	Chaudhuri, Bábu Harachandra, Zamindar. <i>Sherpur, Maimansingh.</i>
1874 Aug. 5.	N.S.	Chennell, A. W., Asst. Surveyor, Survey Dept. <i>Europe.</i>
1877 Aug. 30.	R.	Clarke, Capt. Henry Wilberforce, R. E., Depy. Consulting Engr., Govt. of India, for Guaranteed Railways. <i>Calcutta.</i>
1878 Feb. 6.	R.	Clarke, Colonel the Hon'ble Sir A., R. E., K. C. M. G., C. B., C. I. E. <i>Calcutta.</i>
1878 Mar. 6.	R.	Cockerell, The Hon'ble H. A. <i>Calcutta.</i>
1877 Mar. 7.	R.	Colvin, The Hon. Bazett Wetenhall, c. s., Member of the Governor-General's Council. <i>Calcutta.</i>
1874 Nov. 4.	N.R.	Constable, Archibald, Personal Asst. to Chief Engineer, Railway Dept. <i>Lucknow.</i>
1876 Mar. 1.	R.	Crawfurd, James, B. A., c. s., Barrister at Law, Registrar, High Court. <i>Calcutta.</i>
1877 June 6.	R.	Croft, A. W., M. A., Director of Public Instruction. <i>Calcutta.</i>
1874 Mar. 4.	N.R.	Crombie, Alexander, M. D., Civil Surgeon. <i>Dacca.</i>
1877 Feb. 7.	N.R.	Crooke, William, c. s., Offg. Joint Magistrate. <i>Gorakhpur.</i>
1873 Aug. 6.	R.	Cunningham, David Douglas, M. B., Special Asst. to the Sanitary Commissioner with the Govt. of India. <i>Calcutta.</i>
1847 June 2.	F.M.	Dalton, Major-General Edward Tuite, c. s. I, s. (retired). Queen Anne's Mansions, St. James Park, S. W. <i>London.</i>
1873 Dec. 3.	N.R.	Dames, Mansel Longworth, c. s., Asst. Commissioner. <i>Rajanpur, Punjab.</i>
1877 June 6.	N.R.	Darbhanga Maharájá of. <i>Darbhanga.</i>
1865 June 7.	N.R.	Dás, Rajá Jaykissen, Bahádur, c. s. I. <i>Morad.</i>
1871 June 7.	R.	Dás, Bábu Ramkrishna. <i>Calcutta.</i>
1879 April 2.	N.R.	Dás, Bábu Ram Saran, M. A. <i>Fyzabad, Oudh.</i>
1869 April 7.	F.M.	Day, Dr. Francis, F. L. S., F. Z. S. <i>Europe.</i>
1856 June 4.	N.S.	DeBourbel, Lieut.-Col. Raoul, R. E. <i>Europe.</i>
1872 Aug. 7.	N.S.	Dejoux, P. <i>Europe.</i>
1869 Oct. 6.	N.R.	Delmerick, J. G., Extra Asst. Commissioner. <i>balla City.</i>

Date of Election.			
1873 Jan. 8.	N.R.	Dennys, H. L., Dist. Supdt. of Police. <i>Sambalpur, C. P.</i>	
1862 May 7.	N.R.	Dhanapati Singh Dughar, Raí Bahádur. <i>Azinganj.</i>	
1853 Sept. 7.	N.S.	Dickens, Major-General Craven Hildesley, B. A., C. S. I., <i>Europe.</i>	
1870 May 4.	F.M.	Dobson, G. E., B. A., M. B., F. L. S., <i>Royal Victoria Hospital. Netley. Southampton.</i>	
1875 Mar. 3.	N.R.	Dodgson, Walter. <i>Rangpur.</i>	
1873 May 2.	R.	Donaldson, P. <i>Calcutta.</i>	
1875 Mar. 3.	R.	Douglas, J., Offg. Supdt. of Telegraphs. <i>Calcutta.</i>	
1879 Feb. 5.	N.R.	Duthie, J. F., Superintendent, Govt. Botanical Gardens. <i>Saharunpore.</i>	
1873 Aug. 6.	R.	Dutt, Bábu Jogesh Chunder. <i>Calcutta.</i>	
1877 Aug. 30.	N.R.	Dutt, Bábu Kedarnath, Personal Asst. to the Rajshahye Commissioner. <i>Rampore Bauleah.</i>	
1873 April 2.	R.	Dutt, Bábu Umesh Chunder. <i>Calcutta.</i>	
1870 Mar. 8.	L.M.	Edinburgh, H. R. H. The Duke of. <i>Europe.</i>	
1863 May 6.	N.R.	Edgar, John Ware, c. s., c. s. I., Offg. Magistrate and Collector. <i>Shahabad, L. P.</i>	
1879 Mar. 5.	R.	Eetvelde, Evan, Consul General for Belgium. <i>Calcutta.</i>	
1874 Dec. 2.	N.R.	Egerton, The Hon. Robert Eyles, c. s., K. C. S. I., c. I. E., Lieut.-Governor of the Panjab. <i>Lahore.</i>	
1871 Dec. 2.	R.	Eliot, J., M. A., Meteorological Reporter to Govt. of Bengal. <i>Calcutta.</i>	
1871 Oct. 4.	N.R.	Evezard, Col. G. E. <i>Deesa, Gujarat.</i>	
1859 Dec. 7.	R.	Fath Ali, Maulawí. <i>Calcutta.</i>	
1863 Jan. 15.	R.	Fedden, Francis, Asst., Geological Survey of India. <i>Geol. Survey Office. Calcutta.</i>	
1876 Jan. 5.	R.	Feistmantel, Ottokar, M. D., Palæontologist, Geological Survey of India. <i>Calcutta.</i>	
1876 July 5.	N.R.	Foulkes, The Rev. Thos., Chaplain. <i>Bangalore.</i>	
1868 May 6.	N.R.	Field, Charles Dickenson, M. A., LL. D., c. s., Barrister at Law, District Sessions Judge. <i>Burdwan.</i>	
1879 July 2.	N.R.	Finucane, M., c. s., Settlement Officer. <i>Darbhanga.</i>	
1869 Sept. 1.	N.R.	Fisher, John Hadden, c. s., Depy. Commissioner. <i>Jabalpur.</i>	
1872 Dec. 4.	N.R.	Forbes, Major John Greenlaw, B. E., Supdg. Engineer, N. W. P. & Oudh Irrigation Branch. <i>Lucknow.</i>	
1869 Sept. 1.	N.R.	Fryer, Major G. E., Depy. Commissioner, Tavoy District. <i>B. Burmah.</i>	
1867 Sept. 4.	N.S.	Fyfe, The Rev. W. C., M. A., Principal, Free Church College. <i>Europe.</i>	
1873 Dec. 3.	N.R.	Gamble, J. S., B. A., Asst. to Inspector General of Forests. <i>Darjiling.</i>	
1871 Aug. 2.	N.R.	Gangaprasad, Munshi, Depy. Collector. <i>Jaunpur.</i>	
1874 July 1.	N.R.	Gardner, David Mason, c. s., Offg. Magistrate and Collector. <i>Azamgarh.</i>	

Date of Election.		
1879 Mar. 5.	N.S.	Garrett, A. W., M. A., Inspector of Schools, Presy. Circle. <i>Europe.</i>
1859 Aug. 3.	L.M.	Gastrell, Major-General James Eardley (retired). 7, <i>Landsowne Road, Wimbledon.</i>
1867 Dec. 4.	N.R.	Gay, E. M. A., C. S., Depy. Comptroller General. <i>Bombay.</i>
1877 Aug. 30.	R.	Ghosha, Bábu Jnanendra Chandra. <i>Calcutta.</i>
1871 May 3.	R.	Ghosha, Bábu Káliprasanna. <i>Calcutta.</i>
1877 Dec. 5.	N.R.	Ghosha, Dr. Krishna Dhana. <i>Rungpur.</i>
1869 Feb. 3.	R.	Ghosha, Bábu Pratápachandra, B. A. <i>Calcutta.</i>
1870 May 4.	R.	Ghoshál, Rájá Satyánand. <i>Calcutta.</i>
1875 July 7.	N.R.	Girdlestone, Charles Edward Ridgway, C. S. Resident. <i>Katmandu, Nepal.</i>
1861 Feb. 5.	F.M.	Godwin-Austen, Lieut.-Colonel H. H., F. Z. S., F. R. G. S. <i>United Service Club, St. James', London.</i>
1862 July 2.	N.R.	Gordon, Robert, C. E., Executive Engineer, P. W. D., <i>Henzada, B. Burmah.</i>
1869 July 7.	N.R.	Gordon, James Davidson, C. S., C. S. I., Offg. Chief Commissioner. <i>Mysore.</i>
1875 July 7.	N.S.	Gouldsbury, J. R. E. <i>Europe.</i>
1863 Nov. 4.	F.M.	Gowan, Major-General J. Y. <i>Woodlands, Wimbledon, London.</i>
1879 Jan. 8.	N.R.	Gowan, Capt. W. E., 21st Nat. Infy. <i>Kuram Valley.</i>
1877 Nov. 7.	L.M.	Grant, Alexander, M. I. C. E., Director of State Railways. <i>Europe.</i>
1876 Nov. 15.	N.R.	Grierson, George Abraham, C. S., Offg. Joint Magistrate. <i>Madhubani, Darbhanga.</i>
1861 Sept. 4.	N.R.	Griffin, Lepel Henry, B. C. S., Depy. Commissioner and Offg. Secy. to the Govt. of the Punjab. <i>Lahore.</i>
1878 May 2.	N.R.	Griffith, R. <i>Allahabad.</i>
1861 Feb. 6.	N.R.	Growse, Frederick Salmon, M. A., C. S., C. I. E., Joint Magistrate. <i>Bulandshahr, N. W. P.</i>
1875 Jan. 6.	N.S.	Gunn, John Sutherland, M. B., Surgeon, 4th Bengal Cavalry.
1867 July 3.	N.R.	Hacket, Charles Augustus, Asst., Geol. Survey of India.
1879 Mar. 5.	R.	Harraden, S. <i>Calcutta.</i>
1861 Feb. 2.	N.R.	Harrison, A. S., B. A., Principal, Muir Central College. <i>Allahabad.</i>
1877 Sept. 27.	R.	Hart, J., Attorney at Law. <i>Calcutta.</i>
1875 Mar. 3.	N.R.	Hendley, Dr. Thomas Holbein, Residency Surgeon. <i>Jaipur, Rájputaná.</i>
1879 Mar. 5.	N.R.	Herschel, Major J., Survey of India. <i>Dehra Dun.</i>
1875 Aug. 4.	N.R.	Hewitt, James Francis Katherinus, C. S., Commissioner. <i>Chota Nagpur.</i>
1872 Dec. 4.	R.	Hoernle, Rev. A. F. R., PH. D., Cathedral Mission College. <i>Calcutta.</i>
1878 Mar. 6.	N.R.	Hocy, W. <i>Lucknow, Oudh.</i>

Date of Election.		
1873 Jan. 8.	L.M.	Houstoun, G. L., F. G. S. <i>Johnstone Castle, Renfrewshire, Scotland.</i>
1863 Jan. 15.	N.R.	Howell, Mortimer Sloper, C. S., Joint Magistrate. <i>Hamirpur.</i>
1867 Aug. 7.	N.R.	Hughes, T. H., A. B. S. M., F. G. S., Asst., Geol. Survey of India. <i>Kutni.</i>
1866 Jan. 17.	N.R.	Hughes, Captain W. G., M. S. C., Depy. Commissioner, Hill Tracts. <i>Arracan.</i>
1878 Sept. 25.	N.R.	Hughes, G., C. S., Assistant Commissioner. <i>Montgomery, Panjab.</i>
1870 Jan. 5.	R.	Hume, Allan Octavian, C. B., C. S. <i>Calcutta.</i>
1872 Dec. 4.	N.R.	Ibbetson, Denzil Charles Jelf, C. S., Asst. Commissioner. <i>Karnal, Panjab.</i>
1866 Mar. 7.	N.R.	Irvine, William, C. S., Joint Magistrate. <i>Ghazipur.</i>
1871 Mar. 8.	N.S.	Isaac, T. S., C. E. <i>Europe.</i>
1874 Feb. 4.	N.S.	Jackson, Surgeon Major Charles Julian. <i>Europe.</i>
1878 May 2.	R.	Jackson, The Hon'ble L. S., Judge, High Court. <i>Calcutta.</i>
1876 July 5.	N.R.	Jarrad, Lieut. F. W., B. N., F. R. A. S., Depy. Superintendent, Marine Survey Dept.
1879 Mar. 5.	R.	Jarrett, Major H. S., B. S. C., Secy. to the Board of Examiners. <i>Calcutta.</i>
1879 Aug. 6.	F.M.	Joest, Herr W. <i>Cologne.</i>
1866 Feb. 7.	N.R.	Johnson, W. H., C. E., <i>Barrackpore.</i>
1862 Mar. 5.	N.R.	Johnstone, Major James William Hope, Offg. District and Sessions Judge. <i>Peshawar.</i>
1867 Dec. 4.	N.R.	Johnstone, Lieut.-Col. James, Political Agent. <i>Manipur, Assam.</i>
1878 Aug. 7.	N.R.	Johnstone, P. DeLacy, Depy. Commr. <i>Sialkote.</i>
1873 Dec. 3.	N.R.	Johore, H. H., Maharaja of, K. C. S. I. <i>New Johore, Singapore.</i>
1873 April 2.	N.R.	Jones, Frederick, C. S., Magistrate and Collector. <i>Tipperah.</i>
1875 Nov. 3.	N.R.	Jones, Samuel Simpson, B. A., C. S., Asst. Commissioner. <i>Rajmehal.</i>
1869 April 7.	R.	Kabiruddin Ahmad, Maulawi. <i>Calcutta.</i>
1878 Mar. 6.	N.R.	Keene, G. H., C. S. <i>Agra.</i>
1874 Dec. 2.	N.R.	Khudabakhsh Khan, Maulawi. <i>Patna.</i>
1867 Dec. 4.	R.	King, G., M. B., F. L. S., Supdt., Royal Botanical Gardens. <i>Sibpur, Calcutta.</i>
1862 Jan. 15.	N.R.	King, W., Jr., B. A., F. G. S., Depy. Supdt. for Madras, Geol. Survey of India. <i>Geol. Surv. Office.</i>
1875 Dec. 1.	R.	Knight, Hon'ble J. B., C. I. E. <i>Calcutta.</i>
1877 Jan. 17.	N.R.	Kishor, Kumara Radha Deb, Juvraj of Hill Tipperah. <i>Tipperah.</i>

Date of Election.		
1877 Sept. 27.	N.R.	La Touche, James John Digges, B. A., C. S., Offg. Joint Magistrate. <i>Muttra.</i>
1878 Aug. 7.	N.R.	Lawrie, Dr. E. <i>Lahore.</i>
1879 Dec. 3.	N.R.	Leonard, G. S., Asst. Traffic Supdt., N. B. State Ry. <i>Saidpur.</i>
1870 July 6.	N.S.	Lethbridge, E. Roper, M. A., C. I. E. <i>Europe.</i>
1879 Mar. 5.	R.	Levinge, H. C., C. E., Joint Secy. to the Govt. of Bengal, D. P. W. <i>Calcutta.</i>
1873 Feb. 5.	R.	Lewis, Timothy Richards, M. B., Special Asst. to Sanitary Commissioner with Govt. of India. <i>Calcutta.</i>
1864 Nov. 2.	R.	Locke, H. H., Principal, School of Art. <i>Calcutta.</i>
1866 Jan. 17.	N.R.	Low, James, Surveyor, G. T. Survey. <i>B. Burmah.</i>
1869 July 7.	N.S.	Lyall, Charles James, B. A., C. S., Under Secretary, Govt. of India, Home, Rev. and Agril. Dept. <i>Europe.</i>
1876 May 4.	R.	Lyall, John M., Messrs. Lyall, Rennie and Co. <i>Calcutta.</i>
1875 Jan. 6.	R.	Lydekker, Richard, Asst., Geol. Survey of India. <i>Geological Survey Office, Calcutta.</i>
1870 April 6.	L.M.	Lyman, B. Smith. <i>Japan.</i>
1866 June 6.	N.S.	Macdonald, Lieut.-Col. J., B. S. C., Depy. Superintendent of Surveys. <i>Europe.</i>
1876 Dec. 6.	N.R.	Macdonald, J. C., Supdt., Tarai District. <i>Nynce Tul.</i>
1879 Feb. 5.	N.R.	Macgregor, Lieut. C. R. <i>Shillong.</i>
1873 Dec. 3.	R.	McLeod, Surgeon-Major Kenneth, M. D., Secretary to the Surgeon-General, Indian Medical Dept. <i>Calcutta.</i>
1848 April 5.	L.M.	Maclagan, Major-General Robert, R.E., F.R.S.E., F.R.G.S. <i>Europe.</i>
1879 Aug. 28.	N.R.	Maconachie, R., C. S., Settlement Officer. <i>Delhi.</i>
1868 Dec. 2.	N.R.	Macauliffe, Michael, B. A., C. S., Depy. Commissioner. <i>Muzaffargarh, Punjab.</i>
1874 Jan. 7.	N.S.	Magrath, Charles Frederick, B. A., C. S., Joint Magistrate. <i>Europe.</i>
1867 April 3.	R.	Mainwaring, Lieut.-Col. George Byres, S. C. <i>Serampur.</i>
1876 Dec. 6.	N.S.	Malleson, Col. G. B., C. S. I. <i>Europe.</i>
1878 April 3.	N.S.	Mallet, F. R., Geological Survey of India. <i>Europe.</i>
1864 July 6.	R.	Mallik, Bábu Devendra. <i>Calcutta.</i>
1869 Sept. 1.	R.	Mallik, Bábu Yadulál. <i>Calcutta.</i>
1872 Nov. 6.	N.R.	Man, E. H., Asst. Supdt. <i>Port Blair, Andamans.</i>
1877 Dec. 5.	N.R.	Mandelli, L. <i>Darjeeling.</i>
1869 July 7.	N.R.	Markham, Alexander Macaulay, C. S., Offg. Magistrate and Collector. <i>Allahabad.</i>
1873 July 2.	N.R.	Marshall, C. W. <i>Gonatra, Synthea.</i>
1873 Aug. 6.	N.R.	Marshall, Lieut.-Col. William Elliot. <i>Ferozepore.</i>

Date of Election.		
1877 Feb. 7.	R.	Marshall, Capt. Geo. Fred. Leycester, R. E., Asst. Secy., Govt. of India, P. W. D. <i>Calcutta.</i>
1876 Jan. 5.	N.R.	McGregor, W., Supdt. Telegraphs. <i>Dhubri, Assam.</i>
1860 Mar. 7.	R.	Medlicott, H. B., M. A., F. R. S., F. G. S., Supdt., Geological Survey of India. <i>Calcutta.</i>
1877 Mar. 7.	R.	Medlycott, The Rev. Adolphus Edwin, PH. D., 3, <i>Cullen Place, Howrah.</i>
1871 Sept. 8.	N.R.	Miles, Lieut.-Colonel S. B., s. c., Consul-General. <i>Bagdad.</i>
1870 July 6.	R.	Miller, A. B., B. A., Barrister at Law, Official Assignee. <i>Calcutta.</i>
1874 May 6.	N.R.	Minchin, F. J. V. <i>Aska, Ganjam.</i>
1875 Aug. 4.	N.S.	Minchin, Lieut.-Col. C. C., Political Agent and Supdt., Bahawalpur State. <i>Europe.</i>
1856 Mar. 5.	R.	Mitra, Rájendralála, Bábu, Rái Bahádur, C. I. E., LL. D. <i>Calcutta.</i>
1876 Dec. 6.	N.S.	Mockler, Major E., Political Agent. <i>Europe.</i>
1874 July 1.	R.	Molesworth, G. L., c. E., Consulting Engineer to Govt. of India for State Railways. <i>Calcutta.</i>
1854 Dec. 6.	R.	Morris, The Hon'ble George Gordon, B. C. S., Judge, High Court. <i>Calcutta.</i>
1878 May 2.	R.	Moyle, J. C., Barrister at Law, High Court. <i>Calcutta.</i>
1864 Nov. 2.	N.R.	Mukerjea, Bábu Bhudeva, Inspector of Schools. <i>Chinsurah.</i>
1879 May 7.	N.R.	Muir, J. W., M. A., c. s., Barrister at Law. <i>Mainpuri, N. W. P.</i>
1867 Mar. 6.	R.	Mukerjea, Bábu Pearimohan, M. A., Pleader, High Court. <i>Uttarpara.</i>
1876 May 4.	R.	Nash, A. M., M. A., Professor, Presidency College. <i>Calcutta.</i>
1865 Feb. 1.	R.	Nevill, G., c. M. Z. S., Indian Museum. <i>Calcutta.</i>
1869 July 7.	N.R.	Nursing Rao, A. V. <i>Vizagapatam.</i>
1871 July 5.	N.R.	Oates, E. W., c. E., Engineer, P. W. D., Garrison Div., Sittang Canal. <i>Rangoon, Pegu.</i>
1879 Mar. 5.	N.R.	O'Brien, E., c. s., Settlement Officer. <i>Muzaffargarh.</i>
1874 Oct. 4.	R.	O'Kinealy, The Hon'ble James, c. s., District and Sessions Judge, 24-Pergannahs. <i>Calcutta.</i>
1879 Aug. 28.	F.M.	Oldham, Surgeon-Major C. F., F. R. S., c/o <i>Messrs. Grindlay and Co. Calcutta.</i>
1873 Aug. 6.	N.R.	Olpherts, W. J., c. E., Resident Engr., E. I. Railway. <i>Benares.</i>
1873 Aug. 6.	R.	Parker, J. C., Custom House Agent. <i>Calcutta.</i>
1862 May 7.	L.M.	Partridge, Surgeon-Major Samuel Bowen, M. D. <i>Europe.</i>
1879 Mar. 5.	N.R.	Pawsey, R., c. s., Collector. <i>Cuttack.</i>
1871 Dec. 6.	F.M.	Peal, S. E., Manager, Sapakati Tea Estate. <i>Europe.</i>



Date of Election.		
1860 Feb. 1.	N.R.	Pearse, Lieut.-Col. G. G. <i>Bangalore.</i>
1873 Aug. 6.	R.	Pedler, Alexander, Professor of Chemistry, Presidency College. <i>Calcutta.</i>
1864 Mar. 2.	N.R.	Pellew, Fleetwood Hugo, c. s., Offg. Commissioner. <i>Dacca.</i>
1865 Sept. 6.	N.R.	Peppé, T. E. <i>Ranchi.</i>
1877 Aug. 1.	F.M.	Peters, C. T., M. B., Offg. Civil Surgeon. <i>Zanzibar.</i>
1868 May 6.	N.R.	Peterson, F. W., Bombay Mint. <i>Bombay.</i>
1835 July 1.	F.M.	Phayre, Lieut.-G., Sir Arthur Purves, K. C. S. I., C. B. <i>Mauritius.</i>
1875 Feb. 3.	N.R.	Porter, W., Asst. Supdt. of Police. <i>Akyab.</i>
1872 Dec. 4.	R.	Pránnáth Sarasvati, Pandit, M. A., B. L. <i>Bhowanipur</i>
1878 Feb. 6.	R.	Prinsep, the Hon'ble H. T., Judge of the High Court <i>Calcutta.</i>
1874 Dec. 2.	N.S.	Protheroe, Major M. <i>Europe.</i>
1878 Aug. 29.	N.R.	Rangoon, Right Rev., Bishop of. <i>Rangoon.</i>
1877 May 2.	N.R.	Ravenshaw, Thomas Edw., c. s., Commissioner of Burdwan Division. <i>Chinsurah.</i>
1868 April 1.	N.R.	Rái, Rájá, Pramathanáth. <i>Digapati.</i>
1876 July 5.	R.	Raye, D. O'Connell, M. D., 1st Resdt. Surgeon, Presidency General Hospital. <i>Calcutta.</i>
1877 Aug. 1.	N.R.	Rees, J. C., Asst. Engr. P. W. D. <i>Thonzai, B. Burmah.</i>
1871 July 5.	N.S.	Reid, James Robert, c. s. <i>Europe.</i>
1872 April 3.	N.R.	Richards, Dr. Vincent. <i>Goalundo.</i>
1860 Jan. 3.	N.R.	Rivett-Carnac, John Henry, c. s., C. I. E., Opium Agent. <i>Ghazipur.</i>
1863 April 1.	N.R.	Robertson, Charles, c. s., Secretary to the Govt., N. W. P. and Oude. <i>Allahabad.</i>
1878 Sept. 25.	R.	Robertson, Rev. J., Principal, Doveton College. <i>Calcutta.</i>
1865 Feb. 1.	R.	Robinson, S. H. <i>Calcutta.</i>
1876 Dec. 6.	N.S.	Rodon, Lieut. G. S., Royal Scots. <i>Europe.</i>
1870 Jan. 5.	N.R.	Ross, Major Alexander George, Staff Corps, 2nd in Comd., 1st Sikh Infy. <i>Dera Ghazi Khan, Panjab.</i>
1877 May 2.	N.R.	Sandford, W., Assistant Traffic Manager, Nizam's State Railway. <i>Secunderabad, Deccan.</i>
1878 Jan. 2.	R.	Sawyer, Capt. H. A., Military Department. <i>Calcutta.</i>
1870 May 4.	N.R.	Schlich, Dr. W. <i>Darjiling.</i>
1879 May 7.	N.S.	Schroder, J. <i>Europe.</i>
1869 Feb. 3.	R.	Schwendler, L., Telegraph Store Department. <i>Calcutta.</i>
1879 Feb. 5.	R.	Sconce, Lt.-Col. J., B. s. c. <i>Calcutta.</i>
1876 July 5.	N.S.	Scott, Ross, c. s. <i>Europe.</i>
1874 July 1.	N.R.	Scully, Dr. John, Residency Surgeon. <i>Gilgit, Kashmir.</i>
1874 Dec. 2.	N.R.	Sen, Dr. Rám Dás. <i>Berhampur.</i>
1879 Jan. 8.	F.M.	Sewell, R., M. S. C. <i>Europe.</i>

Date of Election.		
1878 May 2.	N.S.	Sharpe, C. J. <i>Europe.</i>
1879 May 7.	N.R.	Sheridan, C. J., c. e. <i>Jhansi.</i>
1878 April 3.	R.	Simson, A. <i>Calcutta.</i>
1876 April 5.	R.	Singh, Kumara Kantichandra. <i>Calcutta.</i>
1878 Oct. 4.	N.R.	Singh, Rájá Lachman. <i>Bulandshahar.</i>
1869 Feb. 3.	N.R.	Singh, Giriprasád, Thákur. <i>Biswan Fort, Allighar.</i>
1853 Dec. 7.	N.R.	Singh, Rájá Isvariprasád, Bahádur. <i>Benares.</i>
1859 Aug. 3.	R.	Sinha, Bábu Balaichánd. <i>Calcutta.</i>
1877 Aug. 30.	N.R.	Singha, Pratápanaráyan, Deputy Magte. <i>Bankoora.</i>
1867 April 3.	R.	Sirkár, Dr. Mahendralála. <i>Calcutta.</i>
1872 Aug. 7.	N.R.	Skrefsrud, Rev. L. O., India Home Mission to the Santhals. <i>Dumka, Santhal Purgunnahs.</i>
1864 Sept. 7.	N.S.	Sladen, Lieut.-Col. E. B., m. s. c., Commissioner, Arracan Division. <i>Europe.</i>
1875 Feb. 3.	N.S.	Smidt, John. <i>Europe.</i>
1865 July 5.	R.	Smith, David Boyes, M. D., Medical College. <i>Calcutta.</i>
1874 June 3.	N.R.	Smith, Vincent Arthur, c. s., Asst. Settlement Officer. <i>Hamirpur, N. W. P.</i>
1879 Mar. 5.	R.	Someren, Capt. G. J. van. <i>Calcutta.</i>
1878 Mar. 6.	R.	Souttar, W. M., Chairman of the Corporation <i>Calcutta.</i>
1877 April 4.	N.R.	Spens, The Rev. A. N. W., Chaplain. <i>Sialkot.</i>
1872 July 3.	N.R.	Stephen, Carr, B. L., Judl. Asst. Commr. <i>Ludianah.</i>
1879 Oct. 2.	R.	Sterndale, R. A., F. B. G. S., Asst. Comr. of Currency. <i>Calcutta.</i>
1875 July 7.	R.	Stewart, M. G. <i>Calcutta.</i>
1876 Aug. 2.	N.R.	St. John, Major Oliver Beauchamp, R. E., C. S. I., Frontier Expeditionary Force. <i>Quettah Column.</i>
1861 Sept. 4.	R.	Stokes, The Hon'ble Whitley, C. S. I., C. I. E. <i>Calcutta.</i>
1869 Feb. 3.	R.	Strachey, The Hon'ble Sir J., K. C. S. I., C. I. E. <i>Calcutta.</i>
1859 Mar. 2.	N.R.	Stubbs, Lieut.-Col. Francis William, Royal Artillery. <i>Lucknow.</i>
1864 Aug. 11.	R.	Swinhoe, W., Attorney-at-Law. <i>Calcutta.</i>
1871 Mar. 1.	R.	Tagore, Bábu Dvijendranath. <i>Calcutta.</i>
1871 Jan. 4.	R.	Tagore, Bábu Gunendranath. <i>Calcutta.</i>
1868 June 3.	R.	Tagore, The Hon'ble Jotendra Mohun, c. s. I., Ma- haraja. <i>Calcutta.</i>
1865 Sept. 6.	R.	Tawney, C. H., M. A., Principal, Presidency College. <i>Calcutta.</i>
1865 April 5.	N.S.	Taylor, R., c. s. <i>Europe.</i>
1874 Mar. 4.	R.	Taylor, Commander A. D., late Indian Navy. <i>Calcutta.</i>
1860 May 2.	N.R.	Temple, The Hon. Sir R., Bart., K. C. S. I., C. I. E., B. C. S. <i>Bombay.</i>
1878 June 5.	N.R.	Temple, Lieut. R. C., s. c., Cantonment Magte. <i>Fe- pore, Punjab.</i>
1876 Feb. 2.	R.	Tennant, Col. James Francis, R. E., F. B. S., C. I. E., Mint Master. <i>Calcutta.</i>
1875 June 2.	N.R.	Thibaut, Dr. G., Prof. Sanskrit College. <i>Benares.</i>
1869 Oct. 6.	N.R.	Thomson, A., The College, <i>Agra.</i>

Date of Election.		
1875 Nov. 3.	N.R.	Thomson, Robert George, c. s., Asst. Commr. <i>Jhelum, Panjab.</i>
1847 June 2.	L.M.	Thuillier, Major-Genl. Henry Edward Landor, R. A., c. s. I., F. R. S. <i>Care of Messrs. Grindlay and Co., 55, Parliament St., London.</i>
1865 July 5.	N.S.	Tolbort, Thos. Wm. Hooper, c. s., Offg. Deputy Commissioner. <i>Gujranwala.</i>
1871 April 5.	F.M.	Treffitz, Oscar. <i>Care of Messrs. E. D. Keilhorn and Co., 16, St. Mary Axe, London.</i>
1861 June 5.	L.M.	Tremlett, James Dyer, M. A., c. s. <i>Europe.</i>
1872 July 3.	N.S.	Trevor, Lieut.-Col. William Spottiswoode, R.E. <i>Europe.</i>
1873 April 6.	R.	Turnbull, Robert, Secretary to the Corporation. <i>Calcutta.</i>
1863 May 6.	N.R.	Tyler, J. W., M. D., F. R. C. S., Supdt., Central Prison. <i>Agra.</i>
1869 Aug. 4.	R.	Wáhid Ali, Prince Jahán Qadr Muhammad, Bahádur. <i>Garden Reach.</i>
1865 Nov. 1.	R.	Waldie, David, F. C. S. <i>Calcutta.</i>
1861 May 1.	R.	Walker, Major-Genl. James T., R. E., C. B., F. R. S., Surveyor General of India. <i>Calcutta.</i>
1875 April 7.	N.S.	Wall, Dr. Alfred John. <i>Europe.</i>
1863 Oct. 7.	R.	Waller, Walter Kerr, M. B. <i>Calcutta.</i>
1865 May 3.	F.M.	Waterhouse, Major James, B. S. C., Dy. Supdt., Survey of India. <i>Europe.</i>
1874 July 1.	N.R.	Watt, Dr. George, Professor, Hughli College. <i>Chinsurah.</i>
1876 Dec. 6.	N.S.	Webb, W. T., M. A., Prof., Dacca College. <i>Europe.</i>
1879 Mar. 5.	N.R.	Weekes, A., c. s., Collector. <i>Chumparun.</i>
1869 Sept. 1.	R.	Westland, James, c. s., Accountant General. <i>Calcutta.</i>
1867 Feb. 6.	N.S.	Westmacott, Edward Vesey, B. A., c. s. <i>Europe.</i>
1862 Oct. 8.	N.S.	Wheeler, James Talboys. <i>Europe.</i>
1878 Aug. 29.	N.R.	Wheeler, P. C., c. s., Asst. Magistrate. <i>Ghazipur.</i>
1878 Sept. 25.	R.	White, The Hon'ble J. Sewell, Judge, High Court. <i>Calcutta.</i>
1875 Feb. 3.	N.R.	Whiteway, Richard Stephen, c. s., Asst. Settlement Officer. <i>Muttra.</i>
1878 Aug. 29.	N.R.	Whittall, R., Forest Dept. <i>Toungoo, British Burmah.</i>
1873 May 7.	N.R.	Williams, George Robert Carlisle, B. A., c. s., Offg. Joint-Magte. and Collr. in charge of Ballia. <i>Ghazipur.</i>
1867 Jan. 16.	N.R.	Williamson, Capt. William John, Inspr. Genl. of Police. <i>Shillong, Khasi Hills.</i>
1870 Aug. 3.	N.R.	Wilson, Robert Henry, B. A., c. s., Offg. Secy. to Board of Revenue. <i>Calcutta.</i>
1878 Mar. 6.	N.R.	Wilson, J. <i>Gurgaon, Punjab.</i>
1866 Mar. 7.	L.M.	Wise, Dr. J. F. N. <i>Rostellan, County Cork. Ireland.</i>
1867 July 3.	N.R.	Wood, Dr. Julius John, Supdt. of Vaccination. <i>Ráncchi.</i>

Date of Election.		
1870 Jan. 5.	R.	Wood-Mason, James, Offg. Supdt., Indian Museum. <i>Calcutta.</i>
1873 Aug. 6.	N.R.	Woodthorpe, Capt. Robert Gossett, R. E., Asst. Supdt., Survey of India. <i>Frontier Expeditionary Force.</i> <i>Kurm Valley Column.</i>

## HONORARY MEMBERS.

1821 Mar. 6.		Sir John Phillippart. <i>London.</i>
1826 July 1.		Count de Noe. <i>Paris.</i>
1834 May 6.		Professor Isaac Lea. <i>Philadelphia.</i>
1847 Sept. 1.		Col W Munro. <i>London.</i>
1847 Nov. 3.		His Highness the Nawáb Nazim of Bengal. <i>Europe.</i>
1848 Feb. 2.		Dr. J. D. Hooker, R. N., F. R. S. <i>Kew.</i>
1853 April 6.		Major-Gen. Sir H. C. Rawlinson, K. C. B. <i>London.</i>
1858 July 6.		B. H. Hodgson. <i>Europe.</i>
1859 Mar. 2.		The Hon'ble Sir J. W. Colville, Kt. <i>Europe.</i>
1860 „ 7.		Professor Max Müller. <i>Oxford.</i>
1860 Nov. 7.		Edward Thomas. <i>London.</i>
1860 „ 7.		Dr. Aloys Sprenger. <i>Bern.</i>
1860 „ 7.		Dr. Albrecht Weber. <i>Berlin.</i>
1868 Feb. 5.		General A. Cunningham, C. S. I. <i>India.</i>
1868 „ 5.		Professor Bápu Déva Sástri. <i>Benares.</i>
1868 „ 2.		A. Grote. <i>London.</i>
1871 „ 7.		Charles Darwin. <i>London.</i>
1872 „ 1.		Sir G. B. Airy. <i>London.</i>
1872 June 5.		Professor T. H. Huxley. <i>London.</i>
1875 Nov. 3.		Dr. O. Böhtlingk. <i>Jena.</i>
1875 „ 3.		Professor J. O. Westwood. <i>Oxford.</i>
1876 April 5.		Col. H. Yule, R. E., C. B. <i>London.</i>
1876 „ 5.		Dr. Werner Siemens. <i>Berlin.</i>
1877 Jan. 17.		Dr. John Muir. <i>Edinburgh.</i>
1879 June 4.		Prof E. B. Cowell, D. C. L. <i>Cambridge.</i>
1879 „ 4.		Dr. A. Günther, V. P. R. S. <i>London.</i>
1879 „ 4.		Dr. J. Janssen. <i>Paris.</i>
1879 „ 4.		Prof. H. Milne-Edwards. <i>Paris.</i>
1879 „ 4.		Prof. P. Regnaud. <i>Lyons.</i>
1879 „ 4.		M. E. Renan. <i>Paris.</i>

## CORRESPONDING MEMBERS.

1844 Oct. 2.		Macgowan, Dr. J. <i>Europe.</i>
1856 June 4.		Krämer, Herr A. von. <i>Alexandria.</i>
1856 „ 3.		Porter, Rev. J. <i>Damascus.</i>
1856 „ 4.		Schlagintweit, Herr H. von. <i>Munich.</i>

1856 June.	4.	Smith, Dr. E.	<i>Beyrout.</i>
1859 „	4.	Taylor, J., Esq.	<i>Bussorah.</i>
1857 Mar.	4.	Nietner, J., Esq.	<i>Ceylon.</i>
1858 „	3.	Schlagintweit, Herr R. von.	<i>Giessen.</i>
1859 Nov.	2.	Frederick, Dr. H.	<i>Batavia.</i>
1860 Feb.	1.	Baker, The Rev. H.	<i>E. Malabar.</i>
1861 July	3.	Gösche, Dr. R.	
1862 Mar.	3.	Murray, A, Esq.	<i>London.</i>
1863 July	4.	Barnes, R. H., Esq.	<i>Ceylon.</i>
1866 May	7.	Schlagintweit, Prof. E. von.	<i>Munich.</i>
1866 „	7.	Sherring, Rev. M. A.	<i>Benares.</i>
1868 „	5.	Holmböe, Prof.	<i>Christiania.</i>

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#### ASSOCIATE MEMBERS.

1865 May	3.	Dall, Rev. C. H.	<i>Calcutta.</i>
1874 Feb.	4.	Schaumburgh, J., Esq.	<i>Calcutta.</i>
1874 April	1.	Lafont, Rev. Fr. E., s. J., C. I. E.	<i>Calcutta.</i>
1875 Dec.	1.	Bate, Rev. J. D.	<i>Allahabad.</i>
1875 „	1.	Maulawi Abdul Hai,	<i>Madrasah. Calcutta.</i>

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#### LIST OF MEMBERS WHO HAVE BEEN ABSENT FROM INDIA THREE YEARS AND UPWARDS.\*

\* *Rule 40.*—After the lapse of 3 years from the date of a Member leaving India, if no intimation of his wishes shall in the interval have been received by the Society, his name shall be removed from the list of Members.

The following Members will be removed from the next Member List of the Society under the operation of the above Rule.

J. Smidt, Esq. ....	1876.
R. Taylor, Esq. ....	1877.

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#### LOSS OF MEMBERS DURING 1879.

##### BY RETIREMENT.

A. H. Anthony, Esq.	<i>Calcutta.</i>
Lt.-Col. E. G. Clark.	<i>Sultanpur.</i>
W. Duthoit, Esq.	<i>Shahjehanpur.</i>
Bābu Uday Chand Dutt.	<i>Serampur.</i>
Major W. R. M. Holroyd.	<i>Punjab.</i>
W. Mackay, Esq.	<i>Nusseerabad.</i>
R. Parry, Esq.	<i>Calcutta.</i>
H. S. Reid, Esq.	<i>Allahabad.</i>
Major W. L. Samuells.	<i>Lohardugga.</i>
E. White, Esq.	<i>Allahabad</i>
I. J. Whitty, Esq.	<i>Giridhi.</i>
C. H. Wood, Esq.	<i>Calcutta.</i>
A. Wilson, Esq.	<i>Calcutta.</i>
A. Smidt, Esq.	<i>Calcutta.</i>

BY DEATH.

*Ordinary Members.*

Nawáb Amir Ali Khán Bahádur. *Calcutta.*  
 R. S. Brough, Esq. *Calcutta.*  
 G. H. Damant, Esq. *Naga Hills.*  
 R. B. Shaw, Esq. *Mandalay.*  
 H. C. Sutherland, Esq. *Backergunge.*  
 Mahárájáh Mirza Vijayanagram. *Benares.*  
 G. Robb, Esq. *Calcutta.*  
 F. L. Beaufort, Esq. *London.*  
 F. Wilcox, Esq. *Manbhum.*  
 Capt. C. J. F. Forbes. *B. Burmah.*

*Honorary Members.*

Prof. Henry. *Princeton, U. S.*  
 M. Stanislas Julien. *Paris.*

BY REMOVAL.

*Under Rule 40.*

Surg.-Maj. J. Ewart.  
 Lt.-Col. J. G. Forlong.  
 G. W. Hoyle, Esq.  
 Dr. W. W. Hunter.  
 Col. H. Hyde.  
 Sir W. Muir.  
 Lord Napier of Magdala.  
 Isaac Newton, Esq.





[APPENDIX.]

ABSTRACT STATEMENT  
OF  
RECEIPTS AND DISBURSEMENTS  
OF THE  
ASIATIC SOCIETY OF BENGAL  
FOR  
THE YEAR 1879.



# STATEMENT, NO. 1.

## Abstract of the Cash Account of the Asiatic Society, 1879.

	For detail see		For detail see
Balance from last account..... Ra.	7,216 10 6	By Expenditure as follows:—	
Balance of Admission Fee Fund, brought forward	164 13 7	Publications..... Ra.	6,588 10 4
To Revenue as follows:—		Library.....	1,608 5 1
Admission Fees.....	1,104 0 0	Coins.....	403 1 0
Subscriptions.....	7,421 13 0	Establishment.....	3,933 10 6
Commutations.....	190 0 0	Building and Furniture.....	549 15 0
Sale of Publications.....	1,628 5 6	Taxes.....	862 0 0
Interest on investment.....	3,264 4 0	Charges on investment.....	12 4 10
Miscellaneous.....	260 5 6	Contingencies.....	1,145 13 8
Conversations.....	267 12 0	Postage.....	422 15 6
Advances.....	14,026 8 0	Conversations.....	288 15 8
Petty Stamp Account.....	431 6 6	Advances.....	15,805 11 7
Various Funds as follows:—		Petty Stamp Account.....	537 1 1
Kurz Memorial.....	60 8 0	Investment, Society's Fund.....	412 5 0
Blochmann Memorial.....	947 0 0	" Piddington Fund.....	2,344 0 0
Piddington Pension.....	370 10 5	Various Funds as follows:—	400 0 0
	1,368 2 5	Stoliczka Memorial.....	273 7 0
		Oldham Memorial.....	163 1 6
		Kurz Memorial.....	50 8 0
		Blochmann Memorial.....	8 13 6
			485 14 0
		Balance Cash.....	19,984 15 8
		" Bank of Bengal, account	39 12 2
		No. 1.....	8,570 1 4
		" Ditto, account No. 2.....	7 7 10
			3,617 5 4
		Total, Ra.	23,602 5 0
		Agreed with the recorded accounts.	
		J. WESTLAND.	
		J. C. DOUGLAS.	

# Statement of Detail of Receipts and Charges.

<i>a</i>	Sale of godown and old bricks.....	Ra.	140	0	0
	Fines, &c.....		22	2	8
	Recovery of charges on account Oldham Memorial.....		87	12	9
	Recovery of price of Coins.....		0	6	6
			250	5	6
<i>b</i>	Subscription for Kurz Memorial.....		50	8	0
<i>c</i>	Subscription for Blochmann Memorial.....		947	0	0
<i>d</i>	Interest on Securities.....		29	4	0
	Excess received on investment.....		2	10	8
	Unexpended balance of Oldham Memorial.....		65	4	9
	Ditto ditto of Stoliczka Memorial.....		273	7	0
			370	10	5
<i>e</i>	Lithographing and Engraving Charges.....	Ra.	1,321	0	4
	Printing Charges.....		4,987	2	9
	Paper for Plates.....		84	14	6
	A. Grote, Esq., for publication charges of Mr. Moore's Papers on Lepidoptera, £6-6-8.....		76	7	6
	Freight for sending Journal and Proceedings to England.....		72	4	6
	Overland Carriage on Lithographed Plates from England.....		46	12	9
			6,588	10	4
<i>f</i>	Subscription to the "Calcutta Review".....		24	0	0
	Ditto to the "Medical Gazette".....		15	0	0
	Ditto to "Stray Feathers".....		11	0	0
	Ditto to "Bengal Directory".....		14	0	0
	Ditto to "Vedarthayatra".....		6	6	0
	Purchase of Books, through Messrs. Tytner & Co. Ditto through Mr. E. Leroux.....		372	14	6
	Ditto through Messrs. Friedländer & Sohn.....		31	2	6
	Ditto through H. Georg, Bale.....		116	10	6
	Ditto through Capt. Legge.....		12	12	10
	Ditto through Messrs. Higginbotham and Co.....		48	7	3
	Ditto in Calcutta.....		53	4	0
	Book-binding charges.....		466	9	6
			436	2	0
			1,608	5	1
<i>g</i>	Establishment.....		3,628	0	0
	Pension to Islam Khan.....		36	0	0
	Salary for Cataloguing Mr. Hodgson's Nepalese Sanskrit MSS.....		127	11	9
	Ditto for copying Manuscripts.....		26	15	0
	Ditto of Punkah bearer.....		114	15	9
			3,933	10	6

*The following is the "State" of the Society upon 31st December, 1879.*

**xxii**

The Detail of Cash is as follows:—

In hand, as per Cash Book.....	Rs.	39	12	2
In Bank, account No. 1.....		3,570	1	4
" account No. 2.....		7	7	10
		<hr/>		
	Rs.	3,617	5	4

Accounts Nos. 1 and 2 will henceforth be amalgamated.

**The detail of the invested balance is as follows:—**

Society',	4 per cent. of 1879, 5,700 @ 92.....	Rs.	5,244	0	0	
	4 per cent. of 1886, 4,000 }					
	4 per cent. of 1842-43, 700 } @ 92.....		4,324	0	0	
	4½ per cent. of 1878-79, 1,27,900 @ 100...		1,27,900	0	0	
			<hr/>	1,37,468	0	0

**J. WESTLAND.**  
**J. C. DOUGLAS.**

Balance from last account.....	Ra. 3,848 3 0	By Expenditure as follows:—	
To Revenue as follows:—		Publications—	
Government grant.....	9,000 0 0	Sāma Veda Sāthitā.....	Ra. 464 14 3
Sales.....	3,002 6 7	Akbar Namah.....	1,128 2 0
Miscellaneous.....	12 0 0	Prithirāj Rāsu.....	236 0 0
Advances.....	94 6 0	Gobhiliya Gṛhiya Sūtra.....	877 0 0
Petty Stamp account.....	154 3 0	Chaturvarga Chintāmani.....	1,674 8 6
	12,363 15 7	Vayu Purāna.....	1,059 0 0
		Agui Purāna.....	184 13 0
		Taittiriya Sāthitā.....	548 3 0
		Tabaqat-i-Naqiri.....	1,443 1 8
		Mimāṃsā Darsana.....	225 2 0
		Bhāmātī.....	171 13 6
		Establishment.....	8,012 9 11
		Catalogue.....	1,176 0 0
		Miscellaneous.....	480 0 0
		Advances.....	190 5 6 <sup>a</sup>
		Petty Stamp Account.....	134 6 3
		Postage.....	184 3 6
			116 3 6
			10,293 12 8
		Balance Cash.....	79 4 1
		" Bank of Bengal.....	5,738 1 10
			5,817 5 11
		Total, Ra. 16,111 2 7	
		Total, Ra. 16,111 2 7	

Agreed with the recorded accounts.

J. WESTLAND.  
J. C. DOUGLAS.

### The Detail Statement of charges for O. P. Fund for 1879.

<sup>a</sup> Advertising charges.....	Ra. 130 0 0
Freight for sending books to England.....	36 8 0
Commission on collecting bills.....	1 8 6
Book-binding charges.....	18 6 0
Fee for Stamping Cheques.....	3 2 0
Petty charges.....	1 13 0
	Ra. 190 5 6

STATEMENT, NO. 4.  
*Assets and Liabilities of the Asiatic Society, O. P. Fund, on 1st January, 1880.*

ASSETS.		LIABILITIES.	
Personal account.....	Ra. 1,164 5 11	Personal account.....	
Cash, and Bank.....	6,817 5 11	Dr. Muir's.....	Ra. 898 10 0
		" Government, N. W. P.....	1,040 0 0
		" Miscellaneous.....	38 4 0
			<hr/>
		Balance.....	1,976 14 0
			<hr/>
			5,004 13 10
			<hr/>
		Total, Ra.	6,981 11 10
			<hr/>
			J. WESTLAND.
			J. C. DOUGLAS.

# ANNUAL STATEMENT OF THE ACCOUNTS OF THE SANSKRIT MSS. FUND FOR 1879.

Balance from last account.....	Ra. 768 9 5	By Expenditure as follows:—	
To Revenue as follows:—		Purchases and copying.....	Ra. 1,422 15 0
Government grant.....	4,800 0 0	Salaries and allowance.....	1,548 8 0 <sup>a</sup>
Miscellaneous.....	43 6 0	Miscellaneous.....	785 13 3 <sup>b</sup>
Advances.....	1,009 0 0	Advances.....	1,309 0 0
	5,862 6 0	Postage.....	4 12 6
		Balance Cash.....	5,071 0 9
		" Bank of Bengal.....	11 8 6
			1,528 6 2
			1,539 14 8
		Total, Ra.....	6,610 15 5

## The Detail Statement of charges for Conservation of Sanskrit MSS. Fund for 1879.

<sup>a</sup> Salary for preparing Catalogue of Sanskrit MSS.	Ra. 360 0 0
Ditto translating ditto.....	240 0 0
Ditto travelling Pandit.....	660 0 0
Travelling allowances.....	164 8 0
Assistant Secretary's bonus.....	160 0 0
Salary for bearer.....	84 0 0
	Ra. 1,548 8 0

<sup>b</sup> Printing charges of Notices of Sanskrit MSS.....	748 0 0
Petty charges.....	37 13 3
	Ra. 785 13 3

### ASSETS.

Cash.....	Ra. 1,539 14 8
Advanced to Dr. R. Mitra.....	600 0 0
" " N. Mookerjee.....	200 0 0
	Ra. 2,339 14 8

### LIABILITIES.

Balance.....	Ra. 2,339 14 8
	Ra. 2,339 14 8

J. WESTLAND.  
J. C. DOUGLAS.



PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
EDITED BY  
THE HONORARY SECRETARIES.

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JANUARY TO DECEMBER,  
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## CONTENTS.

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	<i>Page</i>
Proceedings for January 1881 .....	1-20
Do. for February, including Annual Report.....	21-48
Do. for March, 1881 .....	49-60
Do. for April, „ .....	61-84
Do. for May, „ .....	85-102
Do. for June, „ .....	103-118
Do. for July, „ .....	119-132
Do. for August, „ .....	133-148
Do. for November, „ .....	149-168
Do. for December, „ .....	169-178
Index .....	179-190
List of Members of the Asiatic Society of Bengal on the 31st December, 1880, Appendix to February Proceedings .....	i-xvi
Abstract Statement of Receipts and Disbursements of the Asiatic Society of Bengal for the year 1880, Appendix to May Proceedings .....	i-xii

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## LIST OF PLATES.

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- I. Trace of Van Rysselberghe and Schubart's Meteorograph (p. 65).
  - II. Facsimile of the last page of a MS. of the Bhatti-Kāvya, dated Saka 1326 (p. 134).
  - III. Tracing from Sun Negative taken at Dehra observatory, G. T. Survey of India (p. 153).
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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
FOR JANUARY, 1881.

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The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 5th of January 1881, at 9 P. M.

H. B. MEDLICOTT, Esq., F. R. S., in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From Dr. R. L. Mitra,—Nidāna, a Sanskrit system of Pathology, translated into Bengali by Uday Chand Dutt.
2. From the Meteorological Reporter for Western India,—(1) Brief sketch of the Meteorology of the Bombay Presidency in 1879, (2) Abnormal Variations of Barometric Pressure in the Tropics and their relation to Sunspots, Rainfall and Famine.
3. From the Hon'ble Whitley Stokes,—*Über die Sprache der Etrusker*, (2 vols.), by W. Corssen.
4. From the Madras Government,—Report on the Amravati Tope, and excavations on its site in 1877, by R. Sewell.
5. From the Department of the Interior, U. S. America,—History of the North American Pinnipeds by J. A. Allen.
6. From the Home, Revenue and Agricultural Department,—(1) Report on the Amravati Tope, and excavations on its site in 1877, by R. Sewell, (2) Max Müller's Sacred Books of the East, Vols. IV, V, and VII.
7. From the Authors,—(1) An account of the Country traversed by the second column of the Tal-Chotali Field Force in the spring of 1879, by Lieut. R. C. Temple, (2) *Gulshan-i-Raz*, the Mystic Rose Garden of Sa'd-ud-din Mahmud Shabistari, by E. H. Whinfield.
8. From Pandit Mohanlal Vishnulal Pandia,—Nos. 1—9 of *Harischandra Chandrika* and *Mohan-chandrika*.

9. From Surgeon-Major A. F. Bradshaw,—Hindu Matrimony, by Babu B. C. Bose.

10. From the Trustees of the British Museum,—Illustrations of Typical specimens of Lepidoptera Heterocera in the Collection of the British Museum, Part IV, by Lord Walsingham.

The following Gentlemen are candidates for ballot at the next meeting—

1. P. J. Carter, Esq., Forest Department, British Burmah, proposed by E. W. Oates, Esq., seconded by A. Pedler, Esq.

2. Capt. T. Morris Jenkins, Asst. Commissioner, British Burmah, proposed by E. W. Oates, Esq., seconded by A. Pedler, Esq.

3. Major W. F. Prideaux, Calcutta, proposed by A. Pedler, Esq., seconded by Capt. W. H. Johnstone, R. E.

4. R. C. Laughlin, Esq., proposed by J. C. Douglas, Esq., seconded by L. Schwendler, Esq.

5. Dr. G. Bomford, Garrison Surgeon, Fort William, proposed by Dr. A. F. Bradshaw, seconded by A. Pedler, Esq.

The SECRETARY reported that Mr. H. A. Cockerell and Mr. J. G. Apear had intimated their desire to withdraw from the Society, and that Mr. W. T. Webb had requested that his letter of resignation might be cancelled.

The following papers were read—

1. *On the Identification of Certain Diamond Mines in India which were known to and worked by the ancients, especially those which were visited by Tavernier.*—By V. BALL, M. A., F. G. S.

(Abstract.)

In this paper the author gives the result of his investigations into the identity of the diamond mines visited and described by Tavernier which have long afforded matter for more or less vague speculation to numerous writers on the subject.

RAOLCONDA is believed to be identical with Rawdukonda in the district of Mudgul in the Nizam's Dominions: it is situated near the Tungabudra river in Lat.  $15^{\circ} 41''$  Long.  $76^{\circ} 50'$ .

GANI-COULOUR is shown to be identical with Kollur on the Kistna river, Lat.  $16^{\circ} 42' 30''$ , Long.  $80^{\circ} 5'$ . Under this heading there is a note on the Great Mogul diamond and its identity with the Koh-i-nur. The prefix Gani is supposed to be simply the Persian *Kan-i-* (i. e. mine of). And the title *Koh-i-nur* may have been suggested by the meaningless name Kollur.

SOMELPOUR appears to have been situated in Chutia Nagpur and probably was in Palanow. It is quite a distinct locality from Sam-

balpur on the Mahanadi with which it has been the custom, hitherto, to identify it. Its position was about Lat.  $23^{\circ} 35'$  Long.  $84^{\circ} 21'$ .

BEIRAGURH, mentioned in the Ain-i-Akbari as having diamond mines, is shown to be identical with Wairagurh in the Chanda district, Lat.  $20^{\circ} 26'$ , Long.  $80^{\circ} 10'$ , where the remains of the mines are still to be seen.

This paper will be published in full in the Journal, Part II.

2. *On a forgotten Record of the occurrence of the Lion in the District of Palamow and its connection with some other facts regarding the Geographical Distribution of Animals in India.*—By V. BALL, M. A., F. G. S.

I have taken the above title for this paper in consequence of the fact that in the accounts of the distribution of the lion in India by the principal writers on the subject, there is no notice of the following statement which occurs in a work by Surgeon Breton "on the Medico-Topography of the Ceded Provinces of the South-West Frontier" published in the year 1826.\* The following is the passage: "A lion in 1814 was shot by the natives near the village of Koondra in Palamow and its skin was seen and recognized by Mr. W. M. Fleming, the then Magistrate of Ramgurb, to be that of a lion." Surgeon Breton adds, "Possibly this may have been a stray animal, for the lion is very little known in South Behar, although the name of *Sheerbubbur* (lion) is familiar to the more intelligent of the natives."

It may appear at first sight that such slight evidence as the above is not of much importance, but viewed in connection with other facts regarding the geographical distribution of animals in India, it is of no little interest.

Mr. W. T. Blanford in a paper published in the Journal for 1867 gives a *resumé* of the information of which he was then in possession as to the distribution of the lion in India during the present century. The most eastern locality he mentions is Sheorajpur, twenty-five miles to the west of Allahabad where a lion was killed in 1864, and he records another as having been killed in Rewah in 1866.

I am inclined to believe in an inherent probability that the lion formerly occurred in Palamow from the fact that I have observed peculiarities in the fauna of that sub-division which serve to separate it from the regions surrounding it, and that in fact it should be regarded as an eastern prolongation of the Gangetic province of Blanford. In a paper published in the Proceedings "On the Mammals of the Mahanadi basin" I stated that so far as I then knew, the Indian Gazelle (*G. Bennettii*) did

\* Govt. Lith. Press, Calcutta, and Transactions of the Medical and Physical Society of Calcutta, Vol. II, P. A. S. B. 1877, p. 168.

not occur to the east of Sirguja ; but since that time I have found that it is not uncommon in Palamow, having been seen by me as far east as Latiahar, Long. 84° 35' E.

Again in a paper on the distribution of birds throughout the region extending from the Ganges to the Godavari,\* I have pointed out that there were indications that Palamow, in consequence of the occurrence within its limits of certain species would in all probability prove to belong to a region or sub-province of geographical distribution distinct from that which includes the rest of Chutia Nagpur.

Although the lion mentioned by Surgeon Breton may have been a stray or solitary one, the fact that Palamow is up to the present day included in the range of the Gazelle, would seem to shew that it had not wandered beyond its legitimate province. This, taken with the fact that the Gazelle and some species of birds keep within these boundaries which are not limited on the south by more than an easily traversable range of hills, affords a case of limitation of distribution sufficiently remarkable to be worthy of permanent record.

3. *A find of coins struck by Gazni Sultans in Lahore.*—By C. J. RODGERS, Principal, College Amritsar.

Some time ago in wandering about the city of Amritsar, as I am pretty well known as an old coin collector, a young Sarraf asked me to look at some coins he had just received. There were two small bags full of them, so I asked permission to take them home and examine them, at my leisure. This was readily granted. On getting them home I examined them, and they proved to be coins of Masaud I of Gazni, Maudud, Abd-ur Rashid, Farrukhzad and Ibrahim, struck in Lahore.

The coins of Masaud were of the horse and bull type with the name مسعود over the horse. But there were several varieties of this exceedingly rare coin. Several had the name just as I have written it. Some had مسعود محمد which is very strange, as the two brothers were deadly enemies to each other. Some had مسعود محمود which is not so strange, as Masaud was son of Mahmud. Some had مسعود which is only a variety of the first. I did not notice one with محمد simply on it, although Thomas in the Chronicles of the Pathan kings says that Sir E. C. Bayley has one of these coins with *Muhammad* on it and one with Masaud.† From this I infer that Mr. Thomas knew of no others. Before this find I had three of Masaud's of this type, and the Rev. J. Doxie has one of Muhammad. Two of the coins of this find had a new name over the horse مردود. There is no mint mark on these coins. But as they were found with a

\* Stray Feathers, Vol. VIII.

† Thomas gives a figure of this coin of Masaud on p. 58.

lot which were all of one mint, and as the whole of the coins were of the same style as to finish and as to metal, I infer that the few without mint names were of the same mint as those which had mint names. Hence I have no hesitation in calling these coins Lahore ones. The Gazni coins are altogether of another type as to execution of inscription and animal-drawing and metal.

Of Maudúd there were, besides the one type already mentioned, three other distinct types. They all had the bull on one side, and over it was the usual inscription in Hindí *Srī Samanta Deva*. The obverses of the coins were covered with Arabic inscriptions round which were margins in Arabic giving originally the mint town and date. In these margins wherever the mint town comes, it is spelt لهور or Lohor. The inscriptions were :—

(a)	(b) عدل	(c)
ابوالفتح	شهاب الدولة	ابوالفتح
شهاب الدولة	و قطب الملة	الا مير الامرا
و قطب الملة	ابو الفتح	شهاب الدولة
مودود	مودود	مودود

The third type has not been published. The dates in the margin are *four* and *five* (only the *unit* figures or words rather are on the coins). Hence as Maudúd reigned from A. H. 432 to 440, the dates are 434 and 435 A. H. Of this third type there were only two. Of type (b) there were 19. Of type (a) no less than 35, but some of them were very much the worse for their being 800 years old.

Of *Abd-ur Rashid* there were several types. All had the bull reverse. The obverse was covered with inscriptions in a circular area round which was a margin sometimes of dots, sometimes of words stating mint town and date.

(a).	عدل	(b) Same as (a)	(c).	عدل
	عدالدولة	only Arabic margins.		عدالدولة
	وزين الملة			وزين الملة
	عبد الرشيد			ابو منصور
	margin of elongated			عبد الرشيد
	pear shaped dots.			Arabic margin.

A variety of (a) has instead of عدل the word فتح. A second variety of the same type has ع. A third type has a flower with a dot on each side of it. Of (a) were 5, of (b) 13, of (c) 8. Thomas marks (a) as "*unique, my cabinet*." But his has not the word *adl* on it, only a dash to indicate its absence.



The coins of *Farrukhzād* were of one type only, and the varieties were those of execution rather than of inscriptions. They had a bull on the reverse as usual. The obverse was occupied by an inscription with dotted margin.

عدل  
جمال الدولة  
ابو شجاع  
فرخ زاد

A variety has فتح instead of عدل

The coins of *Ibrāhīm* were of two types only. Bull reverse. Obverse inscriptions in areas and on margins.

(a)	عدل	(b)	عدل
(49 of this	نصير الدولة	(50 of this	السلطان
type.)	و ظهير الملة	type.)	المعظم
	ابراهيم		ابو المظفر
			ابراهيم
	لوهور		لوهور

Besides these there were great quantities of coins of the ordinary bull and horseman type without any Arabic inscription on them. The find was interesting as showing that these five sovereigns had more or less a hold on Lahore and therefore on the Panjab. Old coins of the different types were perhaps known before. But this find has revealed some new types and has given duplicates of previously esteemed unique ones.

The coins were all of silver and copper. Some however seemed to have more silver in them than copper. Dr. Stülpnagel, W. Theobald, Esq., Dav. Ross, Esq. and myself have secured a few of the best. The rest, about five hundred, will of course find their way to the smelting pot.

4. *On the Coins of the Sikhs.*—By C. J. RODGERS, Principal, Normal College, Amritsar.

(Abstract).

In this paper the author reviews the history of the Sikhs from the time of *Nānak* to the battle of Gujrat, illustrating the later portion of that history by the help of the coins struck by the later Sikh leaders. "It was during the temporary occupation of Lahore by the Sikhs, about 1757, that the first Sikh rupee is said to have been struck by Jas- Singh Kallāl." But this appears to be doubtful. The first undoubted Sikh rupees were struck in 1764 in Lahore and were called *Gobind Shāhi*, not *Nānak Shāhi*, as sometimes stated. The first *Nānak Shāhi* rupees date from 1778. The first rupees issued by Ranjit Singh are of 1800

(i. e. 1857 Samvat). " But they do not contain his name. Ranjit Singh put his name on nothing, gave his name to nothing. The fort he built at Amritsar is called Gobind Garh, the garden he made there, Rám Bágh." After the accession of Ranjit Singh rupees were struck regularly every year at Amritsar and Lahore, and after the conquest of Multán, also at the latter place. For some years his rupees show on the obverse, what looks like a double branch. This is supposed to represent a peacock's tail. These coins are known as *Morá Sháhi* rupees amongst the bankers ; and they are said to have been struck by Ranjit Singh, to gratify the desire of a favourite dancing-girl of his, who wished to have her name placed on his rupees. Another curious rupee of Ranjit Singh was struck at Lahore in 1836 (= Samvat 1893). The reverse has two figures on it, Nának and his Muhammadan fellow-wanderer Mardáná. It is the only one of the kind that Mr. Rodgers says he has seen. Another peculiarity is that all rupees struck after Samvat 1884 (A. D. 1827) and up to 1906 retain the date 1884 or 1885 on the reverse, while the real date is given on the obverse. This is explained by a superstitious notion of Ranjit Singh, that he would thereby prolong the number of the years of his life. The inscriptions on the Sikh coins are either in Persian or in Gurmukhí.

This paper will be published in the Journal, Part I.

5. *Notes on the Inhabitants of the Nicobars.*—By F. A. DE RÖEPSTORFF, *cand. philos. F. R. Danish S. Antiquaries, C. M. E. Dan. G. S. and of the Berlin S. for Anthropol., Ethnol. and Antiquaries, &c.*

In the Proceedings of the Asiatic Society for July 1876 will be found a report on the inland tribe of Great Nicobar\* in which I called attention to this tribe, and quoted what was authentically known about them. I mentioned the visit paid to a remote, and for the time being, deserted village on the Galathea† river by the members of the Danish expedition, and I quoted the description *in extenso*. I then described a visit I paid to the Ganges harbour‡ where I saw a man and two boys belonging to the inland tribe, in whom I failed to see any trace of Negrito or Papuan origin, from which I concluded that the tribe living on the North end of the island is not of such origin as has been supposed. There were at the time sufficient facts to connect him with the Galathea village. His cooking-pot I saw : it was formed (like the one in the Galathea village) of a sheet of bark, and as it was standing on the fire-place with the remains of his last meal, there was no mistake about it. He also produced the same sort of spear

\* The largest and most southern of the Nicobar Islands.

† Running out into the south bay of the Island.

‡ Near the north-west point of Great Nicobar.

as that found south, and also the same bark-made cloth. His height was 5 ft. 8½ in., which showed clearly that no "ito" could be added to his name. From 1876 until the present day, I have always wished to make further enquiries into the question, because I found that the different tribes were described very differently by the Nancowry men who had seen them or had heard of them.

When the settlement at Nancowry was opened in 1870, Okpank (Capt. Johnson), a Nancowry man, went on a visit to Calcutta. On returning he stayed some time at Port Blair with Major Protheroe, and when he saw an Andamanese for the first time, he at once said to Major Protheroe in Malay, that the Andamanese was like a tribe that lived in the interior of Shambelong (Great Nicobar), and seemed afraid of him. Since that time parties of Andamanese have at different times been at Nancowry, but the people there *now* deny that they resemble at all the Great Nicobar inland tribe. Yet that Okpank who is a sharp observer, should have shown such a fright on seeing the Andamanese seems very peculiar, for it could not have been acting on his part, as he did not know that we had any knowledge of the Shom-Bengs of Great Nicobar, or that he had seen them. To me it seemed probable, that there was some resemblance which at first sight reminded him of them, but which on nearer acquaintance might not be so very striking.

Since then the theory of an *inland* tribe in the Andamans has been completely explored and exploded, for several expeditions have been made, and the unknown tribes, so called, are found to be a few migratory clusters of men with free access to the sea, and occupying the seacoast and creeks without making any attempt at cultivation. No boats of any description have been found, and in their camping places no sea shells of salt-water-food were seen, but this does not preclude, in my opinion, other encampments existing where such and other produce of the sea would be found.

On the 26th October last, I again started to Great Nicobar. The plan was to go to Pulo Milo, and to take one man and a little canoe on board to land in. On the morning of the 27th we, however, found ourselves set too easterly, so we proceeded straight to Galathea Bay. The weather was very boisterous and we could not effect a landing, and the morning of the 29th found us again at the N. E. end of Great Nicobar. It was now our intention to anchor off Pulo Condul, and I would from thence have made an attempt to get to their villages by the help of my friends at Condul, but a canoe that came off warned us, that there had been ten deaths among the little population of Condul (Lamongshe), and that all the inhabitants had fled.

The two men that had come off said that we should be able to meet Shom-Bengs not very far off, and they showed us a good anchorage off the village Laful (Trinent). This village lies about four or five miles south of the N. E. Point of Great Nicobar. The wind died away, and we had to anchor

some two miles off. We had brought a Nicobar man from Camorta, and after describing to him what we wanted to do, he was allowed to go ashore with the two who had come off, and who were engaged as our guides.

In the cool of the evening some of the ship's officers and I landed at the village. It consists of 7 or 8 houses, and lies to the north of a creek. Our Camorta guide met us on landing, helplessly drunk; he was boisterous and tried to contradict and counteract us in everything. We found the whole village in mourning, and outside the first house we entered we found the usual sacrifices to the spirits, consisting of cocoanut shells, pandanus bread, troughs and other things belonging to women, which were broken, cut up, and destroyed, which indicated that the sacrifice was for a woman, and so it was, for a woman had died while the men were out at our ship. There she lay still and peaceful, as if she were sleeping. Friends and relatives had assembled and brought gifts of cloth, which were stacked up beside her; they put silver bangles on her feet and arms. They were very quiet, but their grief did not however, prevent them from being curious as to what we wanted, what we had brought with us, and what we were going to take away. They were rather disappointed at my assuring them that our visit was solely intended to open out communications with the Shom-Bengs (or Pengs). They all assured me that they were in this neighbourhood, and the two men who came off in the morning promised to go up with us, and so also did a woman and her husband who knew them well.

While we were in the village the corpse was moved to a larger house and the crying over the dead commenced. Although they all were very much concerned in the mourning, I must say, that they were very hospitable. We were offered seats and young cocoanuts, and some men and women remained to entertain us. The whole place was however as if quite taken up with the dead, and I was heartily glad to get on board again.

A restless fever night made me rather doubtful whether I could undertake the expedition in the morning. Captain Simpson, of the "Constance," kindly offered to come with me, and, with some refreshments packed up, a dry suit, and a bag with presents, we started. At daybreak we landed at Laful. No one was to be seen, but after a while our Camorta man turned up, sober and very sorry (so he said) for his behaviour over night. I warned him that if he would make that good, he must get hold of our second guide (one I had kept on board during the night), and in a few minutes we were off. We entered the creek, and as there is a surf the canoe was sent round first. Just inside the surf we got in and, with three Nicobarese to paddle, started. No scenery can compare as far as I have seen the world, with the luxuriance, beauty and solemnity of the creeks in these islands. They are generally land-locked and the most absolute silence reigns. The light-green mangrove with its many roots in the salt and

brackish water, the Dhunny palm, pandanus, rotangs, and, now and then where higher land skirts the water, foliaceous trees, together with reed-like plants, creepers, and orchids, all pass in succession before the eyes, all graceful forms, which seemingly pour out of the grim muddy soil, so that it is like a fairy land to those who visit it for the first time. In this creek the formation was, however, past the mangrove stage, and only a few of these trees appeared every now and then. At one place a ficus had thrown a root right across a branch of the creek, and had formed almost like a wall. We shot past it, and after a journey of about a mile and a half we landed. An oar was stuck in the mud inside the enclosure made by the outrigger, and the canoe was left. We then proceeded across a large piece of alluvial soil covered with fine grass (not the Savanna Lalang of Camorta), with pandanus and cocoanut plantations. We passed through a village and our guides left their dhaos (heavy Burmese knives some 12 to 18 inches long) in one of the houses. After a while, we struck into the same stream which had carried our boat. It was now no longer fit for canoes, it was rather broad, and ran between boulders with turnings right and left. On the whole we could see by the sun that it kept about the direction west, a little southerly. Occasionally we scrambled out of the stream, and found our way near its side or over some flat short cut of its windings. On one of these we came across a rattan put in the ground like an arch about 5 feet 8 inches high. One of our guides pointed to it, and said it was some joke (*miloe*) of the Shom-Bengs.

Again a little further on, one of the guides pointed out to me a dhaos stuck in a tree, and almost immediately after we came upon a cleared spot. The trees had been felled and the undergrowth cleared away, but it was again nearly covered with secondary growth. In it there were some plantain trees carefully planted out, the young ones hedged in, and 4 Shom-Beng huts. The three huts were evidently intended for habitation, and the fourth either for cooking purposes or for a storehouse; the latter was only  $3\frac{1}{2}$  feet raised from the ground, and was covered with rotangleares. The three houses were 6 feet in length by 4 feet in breadth. They consisted of sticks, 2 or 3 inches thick, in the ground tied together with rattan. About 3 feet from the ground was a platform with overlaying cloven thin stems of some palm, the flat surface uppermost. The roof consisted of 5 or 6 pieces of bark laid across the ridgestick and resting on thick rotangs. These huts stood N. and S. and the ends were open. I might compare them to rough six-posted bedsteads made for a night's rest by travellers on a journey, they certainly could not contain more than a couple each. On the ground round the huts were the remains of their meals. The most notable were some navicellæ and other freshwater and landshells, and the worked out scales of the pandanus trees, which show that they have learnt the secret of making larome (i. e., pan-

danus bread) from the Coast people. I would not suggest that this pandanus bread had been made by Coast-women on a visit because it is a very slow process. The layer of these shells and husks was so thin that it showed that this clearing was not old, for their meals had not got time to grow into a Kiökkenmiödding.

The rain then began pouring down violently and the guides were anxious to return. I showed them, however, what they might expect if we actually came across the people, and as they could not withstand the promise of possessing a couple of plated spoons, they decided that they would find them.

As the rain was heavy the guides left our dry clothes in one of the Shom-Beng houses, a sign, it seemed to me, that property is pretty safe with these people. We then started, and now our guides were very energetic. The road led us up the stream we had hitherto ascended, and it was a desperate scrambling over big, slippery stones, through waterpools, now and then along the sides of the streams. The natives with their naked feet felt none of the inconvenience we did. One guide disappeared ahead, and it was with great trouble we kept the others with our party.

The sun was pretty high when we came to a shady nook where we were to commence climbing the hills. I now resisted and said that the guides must go on, and that we would await their return as it seemed to me useless to go any further, if we were not sure of coming across the people. We only kept the Nancowry man with us. The stream made a turn at this place and formed a big pool. The west side of the stream was bordered by a precipitous cliff, and on our side a few flat rocks gave us a resting-place. The same abundance of vegetation as at the Andamans presented itself on all sides. Trees were growing immediately on the rock, between them was a dense undergrowth of rattans and other palms; up the trunks of the trees were ferns growing, and the tops were interwoven with creepers. Green leaves in every shade from the faded ones that the current carried away past us to the finest light-green were to be seen, but there were no flowers visible. The shade where we lay was complete and cool, and the steadily falling rain helped to keep us from feeling the sun. I noticed that not one little fish nor a shrimp made its appearance and the Nancowry man showed us the artificial stone settings of the Shom-Bengs all along, and said that the stream was well worked by them, and that whenever the rain was not too heavy they scoured it of everything eatable. As the rain became heavier we retreated under the lee of a big tree sitting on the rock under its roots, and were beginning after an hour's waiting to feel rather cool. Suddenly the scene changed. To our left was half hidden to us the spot where our guides had disappeared.

We heard a shout and found that the two guides were there and a Shom-Beng with them. It was the latter who had shouted. He had a spear in his hand and seemed very much afraid, but after a little talk he threw his spear down, and came at once up to me and seated himself quite close, nearly hugging me. One look at him sufficed to assure me that I had now come across a specimen of a curly-haired race, Papuan or Negrito. His hair was bushy and with rather a bend, and was very abundant. It covered the whole surface of his head and was not like the hair of an Andaman Negrito, of the Papuan of New Guinea or of the Negro found in tufts or patches. It had, however, the Papuan quality of being long, longer than the hair of the Andamanese ever is. This hair was, or appeared to be, brownish, interspersed with white, was very coarse and stiff, and gave an exaggerated appearance of size to his head. I beg to enclose a lock of his hair for the examination of the Society. His face was pleasant, especially when smiling, his forehead was high, his eyes were black, his nose well formed and arched, his upper lip was remarkably prominent from the base, his underlip small, his teeth were black but of natural size.\* One tooth was loose, but he could not be prevailed on to part with it. His colour was copper-brown and a shade fairer than our Great Nicobar and Camorta guides. His complexion did not at all remind me of the deep shining black of the Andaman Negrito. His name was Koal. He had his private parts tied up, but in such a loose way, that it was evident that the Coast people are right when they assert that the male Shom-Bengs go quite naked in their own haunts.

I asked to be allowed to go to his place, but he begged of us not to do so, as his wife and three children would be frightened; he promised, however, that if we would return, he would in the evening follow us to a certain house of the Coast people with his wife and children. As I had got the main point settled, namely, that there is a curly-haired race in the island, we came to terms. He allowed me to cut off some of his hair with a curious grin. The spear he brought with him had a handle with an iron spike; he gave it me and on it I cut a notch for his height. His height was 5 ft. 3½ in. (English measure).

Half a bundle of tobacco made him very happy and I gave him some handkerchiefs for his wife. We parted on good terms and he said that he would towards evening come with his family and bring presents for me. He promised to bring me their spears, some of their bark-made cloth (*celtis*? bark) and some produce of his garden.

We then went back. The rain had swollen the stream, and where we had before gone dry shod, we had now to go in water, but the satisfaction of having succeeded in seeing a typical specimen of this curious people made

\* The Coast people have their teeth very much enlarged, see the latter part of this paper.

the road easy. When we reached the deserted Shom-Beng village we were very glad to turn into their houses, Mr. Simpson in one and I in another. The rain was pouring down very heavily, but the house I was in was perfectly dry. From the sheltered position of the village and the direction of the houses, the rain very rarely would beat in heavily. The shelter we gratefully acknowledged, and we faithfully shared our breakfast with the guides, who stared at every mouthful we took. Our claret they scorned; they do not appreciate anything between water and arrack.

We reached the hut that was appointed as our meeting place, and having sent on our guides to bring clothes and food, we made ourselves comfortable in the house which was deserted at the time. At about 5 p. m. the Shom-Beng turned up. By this time the house was full of people. He looked quite a different man. In the morning he had a pleasant expression full of smiles, perhaps he was also a good deal excited. Now he looked fagged and tired, and he had also reason to be so. He brought two enormous bundles of plantains as well as three spears. When I in the morning asked him for something from his garden I meant some rootfruits, not plantains, but I forgot to say so. I wanted to see whether he cultivated like the Shom-Beng I met in 1876. The spears he brought were the same wooden spears that the Galathea expedition obtained in the deserted village, and the same as those I obtained in Ganges harbour in 1876, so that I had there a link that connected the three tribes. He said his wife was unwell and could not come, but he promised me that if I would return another time she would come down. After some pretty speeches on both sides and counter-presents on my side we parted. I beg to forward with this paper a specimen of Koal's (the Shom-Beng's) hair, and hair of two Andamanese lads from the neighbourhood of Port Blair, also one of the spears he brought me, which is the typical Shom-Beng spear without any attached spear-head. It will on examination be seen how very different the samples of hair forwarded are in structure and colour.

On talking with the Coast people about his hair I mentioned to them, that at the Ganges harbour I had met a different sort of man, tall, and with smooth hair, and they at once said: "Yes this is a bad Shom-Beng, there are others, but far away, that have hair like us and that look like us, he is a bad specimen."

As the result of my visit I conclude that there is an element of Papuan origin in the island, that it is only found among the people living inland (*i. e.*, cut off from the sea and communication with the outer world) and that this element is strongly mixed with another not curly-haired race. What the proportion is I cannot say, but the assertion I have so often read, but never seen confirmed by ocular evidence, about a curly-haired race in the interior of Great Nicobar is true. Whether the



Andaman Negrito and this tribe are related is very doubtful. The intermixture with another element may have been so strong that only a trace remains of the origin. My opinion is that it is a Papuan and not a Negrito tribe, but I hope by further investigations to settle this matter.

The people of the Nicobars have all black teeth, owing to the chavica leaf which is chewed together with areca nut and quick shell-lime. The teeth of the natives are however, in the islands of Camorta, Nancowry, Trinkut, Katchall, Great and Little Nicobar, often of an enormous size. A very similar case is reported by Mr. v. Mikludo-Maclay who in the Admiralty Islands found a big-toothed people. His paper is interesting, and it is carefully illustrated.\*

Mr. v. Mikludo-Maclay shows in his illustrations enlarged teeth, mostly of the upper jaw, but he says expressly, "Häufiger waren es die Schneidezähne des Oberkiefers, die vergrößert waren, aber auch nicht selten zeigten die des Unterkiefers dieselbe Eigenthümlichkeit.

With the Nicobarese, I find the teeth of the lower jaw more commonly enlarged. Mr. v. Mikludo-Maclay states that these enormous teeth serve as "chewing plates" (*kauplatten*) and in every word of his description it suits the Nicobarese except in the one that they are a mixed-Malay tribe and the Admiralty-Islanders Melanesians. The teeth of the Nicobarese are white till they begin to eat chavica at the age of six or seven or even before. The enormous development of the teeth begins to show in middle age. They chew quick shell-lime with their areca and chavica, and this produces the phenomenon. Mr. v. Mikludo-Maclay, could not make a collection of their teeth as they would not submit to have them pulled out. Owing to the lucky circumstance that the Nicobarese keep the big teeth they lose, I have been able to make a collection, part of which I beg to present to the Society. Owing to the enormous growth of their teeth the lips in many persons never meet for years till the last big tooth is lost.

I beg to draw attention to the curious fact that the Nancowry people have wild pigs domesticated. I often wondered why the little pigs born in the villages were striped and marked like the litter of wild sows. This is the explanation. All male pigs that are born in the villages are without fail castrated and the sows are well fed. At night fall all the pigs assemble under the house they belong to and are fed by the woman of the house, but during the day they roam in the jungle. It is during these rambles that they meet the wild boars who are fathers to all the litters in the villages. Although instances have happened that a few pigs have been introduced, this is so rare, that it may be said that it is the wild pig of the Nicobars that lives domesticated.

\* Vide Berliner Gesellschaft für Anthropologie, Ethnologie und Urgeschichte; Sitzung von 16 Dec. 1876.

Mr. BALL said :—" I have heard the paper by Mr. de Roepstorff with very great interest as I have always held\* in opposition to his formerly expressed views that there was sufficient testimony in favour of the opinion that the interior of the Great Nicobar was inhabited by a race of people totally distinct from those living on the Coast, and who were most probably closely allied to the Andamanese.

" Col. Yule in his ' Marco Polo' and Mr. Distant in a late number of the Anthropological Institute's Journal both state that they had been informed by Col. Mann, late Superintendent of the Nicobar Islands that some Nicobarese on a visit to Port Blair had pointed spontaneously to the Andamanese as being like the inland race of the Great Nicobar. Mr. de Roepstorff says that the so-called Capt. Johnson, a Nicobarese, also saw the same resemblance when he was at Port Blair, though other Nicobarese at Nancowry denied the resemblance.

" The man whom Mr. de Roepstorff describes in this paper under the title Shom-Beng is clearly not closely allied to the Andamanese. His colour and the character of the hair now exhibited prove that ; but whether he can really be regarded as a typical example of the inland race is of course open to question. No safe generalisation can be made from the characters of a single individual, the more especially of one who seems to have been on terms of intimacy with the coast people. A number of these people who live shut out from intercourse with the coast people must be examined before any conclusive result can be obtained."

At the close of the meeting the Rev. Mr. Dall read some extracts from a letter describing portions of the work done by the United States Coast Survey officers during the past season.

The following communication has been received :—Notes on Serohi Division, Western Rajputana (S.) Railway, by J. W. Parry, C. E.

## LIBRARY.

The following additions have been made to the Library since the meeting held in December last.

## TRANSACTIONS, PROCEEDINGS AND JOURNALS,

*presented by the respective Societies and Editors.*

Berlin. K. 'preussische Akademie der Wissenschaften,—Monatsbericht, August 1880:

• Vide Jungle life in India, p. 379.

- Bombay. The Indian Antiquary,—Vol. X, Pt. 114, January 1881.
- Bordeaux. Société de Géographie Commerciale,—Bulletin, Nos. 22-23.
- Calcutta. Geological Survey of India,—Memoirs, Vol. II, Pts. I-II.
- Geneva. Museo Civico di Storia Naturali,—Annali, Vol. XV.
- Königsberg. Physikalisch-ökonomische Gesellschaft,—Schriften, 1876-79, and Part I of 1880.
- Leipzig. Deutsche morgenländische Gesellschaft,—Zeitschrift, Vol. XXXIV, Parts 2 and 3, 1880.
- Lisbon. Sociedad de Geographia, Boletín,—Second series, No. 1.
- London. Royal Astronomical Society, Monthly Notices, Vol. XL, No. 9.
- . Royal Microscopical Society,—Journal, Vol. III, No. 5, October 1880.
- . Royal Geographical Society,—Proceedings, Vol. II, No. 11, November 1880.
- . The Linnean Society, Journal, Botany,—Vol. XVII, Nos. 103-105, Vol. XVIII, Nos. 106-107.
- . ————. Zoology,—Vol. XIV, No. 80, Vol. XV, Nos. 81, 82, and 83.
- . ————. Transactions, Botany,—Vol. I, Pts. VII, VIII, and IX.
- . ————. Zoology, Vol. II, Pt. I.
- . ————, List of Fellows,—November 1st 1879.
- . The Royal Society,—Proceedings, Vol. XXXI, No. 206.
- . Anthropological Institute of Great Britain and Ireland,—Journal, Vol. X, No. 1, August 1880.
- . Statistical Society,—Journal, Vol. XLIII, Part 3.
- . The Academy,—Nos. 444 to 449.
- . The Athenæum, Nos. 2768 to 2772.
- . Nature,—Vol. XXII, Nos. 568-569, 572, and Vol. XXIII, Nos. 576-580, and Index to Vol. XXII.
- Moscow. Société Impériale des Naturalistes,—Bulletin, Vol. LV, No. 1, 1880.
- Paris. Journal Asiatique,—Vol. XVI, No. 2, August to September 1880.
- . La Société de Géographie,—Bulletin, Vol. XX, August 1880.
- Pisa. Società Toscana di Scienze Naturali,—Atti, Vol. IV, 2.
- Roma. Società degli Spettroscopisti Italiani,—Memorie, Dispensa 6, 7 and 8, June to August 1880.
- Washington. Smithsonian Institution,—Miscellaneous Collections, Vols. XVI, and XVII.
- . ————. Contributions to Knowledge,—Vol. XXII,
- . ————. Annual Report for 1878.

- Wien. K. K. Central-Anstalt für Meteorologie und Erdmagnetismus,—  
Jahrbücher, Vol. XV, Part I; Vol. XVI, Pt. 1.  
Yokohama. The Asiatic Society of Japan,—Transactions, Vol. VIII,  
Pt. 3.

### BOOKS,

*presented by the Authors.*

- TEMPLE, LIEUT. R. C. An Account of the Country traversed by the Second  
Column of the Tal Chotiali Field Force in the spring of 1879. With a  
map. 8vo. London, 1880.  
WHINFIELD, E. H. Gulshan-i-Raz: the Mystic Rose Garden of Sa'd-  
ud din Mahmud Shabistari. The Persian Text, with an English Trans-  
lation and Notes, chiefly from the Commentary of Muhammad Bin Yahya  
Lahiji. 4to. London, 1880.

### MISCELLANEOUS PRESENTATIONS.

- Annual Report on Inland Emigration for the year 1879-80. Fcp., Cal-  
cutta, 1880.  
Report on the Administration of the Salt Department for the year 1879-80.  
Fcp., Calcutta, 1880.  
Annual Report on Emigration from the Port of Calcutta to British and  
Foreign Colonies for 1879-80. Fcp., Calcutta, 1880.  
General Report of Public Instruction in Bengal. Fcp. Calcutta, 1880.  
Indian Forester,—Vol. VI, No. 11, October 1880.

#### BENGAL GOVT.

- BOSE, P. C. Hindu Matrimony, an Essay written under the explicit  
orders of Capt. the Lord William Beresford, V. C., Aide-de Camp to  
H. E. the Viceroy. 8vo., Calcutta, 1880.

#### SURGEON-MAJOR A. F. BRADSHAW.

- WALSINGHAM, LORD. Illustrations of Typical Specimens of Lepidoptera  
Heterocera in the collection of the British Museum. Part IV. North-  
American *Tortricidæ*. 4to., London, 1879.

#### BRITISH MUSEUM.

- SEWELL, R. Report on the Amarāvati Tope, and excavations on its site  
in 1877. 4to., London, 1880.  
MÜLLER, F. MAX. Sacred Books of the East,—Vols. IV, V and VII.  
DARMESTETER, J. The Vendidad, Part I.  
WEST, E. W. Pahlavi Texts.  
JOLLY, J. The Institutes of Vishnu.

HOME, REV. AND AGRIL. DEPT.

SEWELL, R. Report on the Amarávati Tope, and excavations on its site in 1877. 4to., London, 1880.

MADRAS GOVT.

DUTT, UDAY CHAND. Nidána, a Sanskrit System of Pathology. Translated into Bengali. 8vo., Calcutta, 1880.

DR. R. L. MITRA.

Report on the Administration of the Government of the North-West Provinces and Oudh for the year ending 31st March 1880. 8vo., Allahabad, 1880.

GOVT., N. W. PROVINCES.

Report on the Sanitary Administration of the Panjab for the year 1879. 4to., Lahore, 1880.

PANJAB GOVT.

CORSSEN, W. Ueber die Sprache der Etrusker, 2 Vols. 8vo., Leipzig, 1874-75.

HON. WHITLEY STOKES.

ALLEN, J. A. History of North-American Pinnipeds; a monograph of the Walruses, Sea-Lions, Sea-Bears and Seals of North America. 8vo., Washington, 1880.

DEPT. OF THE INTERIOR, U. S. AMERICA.

CHAMBERS, F. Brief sketch of the Meteorology of the Bombay Presidency in 1879. 8vo., Bombay, 1880.

CHAMBERS, F. Abnormal Variations of Barometric Pressure in the Tropics, and their relation to Sunspots, Rainfall and Famine. Fcp., Bombay, 1880.

METEOR. REPORTER FOR WESTERN INDIA.

### PERIODICALS PURCHASED.

Berlin. Journal für reine und angewandte Mathematik,—Vol. XC, No. 2.

Calcutta. Indian Medical Gazette,—Vol. XV, No. 12, Dec 1880.

Geneva. Archives des Sciences Physiques et Naturelles,—Vol. IV, No. 11, November 1880.

Göttingen. Gelehrte Anzeigen,—Nos. 47-51.

———. Nachrichten,—Nos. 17-19.

Leipzig. Annalen der Physik und Chemie,—Vol. XI, No. 3.

———. ———. Beiblätter,—Vol. IV, Nos. 10 and 11.

London. Society of Arts,—Journal, Vol. XXVIII, Nos. 1461-64.

———. Journal of Botany,—Vol. IX, No. 215.

———. Chemical News,—Vol. XLII, Nos. 1094-1098.

———. Entomologist,—Vol. XIII, No. 210.

———. Entomologist's Monthly Magazine,—Vol. XVII, No. 198.

- London. *Messenger of Mathematics*,—Vol. X, No. 6.  
 ———. *Annals and Magazine of Natural History*,—Vol. VI, No. 35.  
 ———. *Nineteenth Century*,—Vol. VIII, No. 45.  
 ———. *Numismatic Chronicle*,—Vol. XIX, No. 74.  
 ———. London, Edinburgh and Dublin *Philosophical Magazine*,—Vol. X, No. 63.  
 ———. *Publishers' Circular*, Vol. XLIII, Nos. 1036 and 1037.  
 ———. *The Journal of Science*,—Vol. II, No. 83.  
 New Haven. *American Journal of Science*, Vol. XX, No. 118.  
 New York. *Academy of Sciences*, Vol. I, Nos. 1-13.  
 ———. *Lyceum of Natural History*,—Vol. XI, No. 13 (Index and Contents).  
 Paris. *Annales de Chimie et de Physique*, Vol. XXI, November 1880.  
 ———. *Comptes Rendus*,—Vol. XCI, Nos. 18-22.  
 ———. *Revue Critique*, Vol. X, Nos. 45-49.  
 Paris. *Revue de Linguistique*,—Vol. XIII, No. 4.  
 ———. *Revue des deux Mondes*,—Vol. XLII, Nos. 2 and 3.  
 ———. *Journal des Savants*,—November, 1880.  
 ———. *Revue Scientifique*,—Vol. XIX, Nos. 20-24.

### BOOKS PURCHASED,

- ALBERTIS, L. M. D'. *New Guinea: what I did and what I saw*. 2 Vols. 8vo., London, 1880.  
 GÜNTHER, DR. A. *An Introduction to the Study of Fishes*. 8vo., Edinburgh, 1880.  
 LEGGE, CAPT. W. V. *A History of the Birds of Ceylon, Part III*. 4to., London, 1880.  
 FISCHER, RICHARD. *Hemacandra's Grammatik der Prakritsprachen (Siddhahemacandram Adhyāya VIII) mit kritischen und erläuternden Anmerkungen, Pt. I*. 8vo., Halle, 1877.  
 SWINTON, A. H. *Insect Variety: its Propagation and Distribution*. 8vo., London.  
 WALLACE, A. R. *Island Life: or the Phenomena and Causes of Insular Faunas and Floras, including a Revision and attempted Solution of the Problem of Geological Climates*. 8vo., London, 1880.  
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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
FOR FEBRUARY, 1881.

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The Annual Meeting of the Asiatic Society of Bengal was held on Wednesday, the 2nd of February, 1881, at 9 P. M.

H. B. MEDLICOTT, Esq., F. R. S., President, in the Chair.

The PRESIDENT then addressed the meeting, saying :

“GENTLEMEN,—You have been summoned for this evening to hold the annual meeting, the first business of which is the election of officers for the ensuing year. I am sorry to have to tell you, and the chief blame must fall upon myself, it has been discovered at the last moment that some informality has occurred in the preparation of the lists, making it advisable to postpone the election till the April meeting. Meanwhile we must call Rule 47 into operation which provides—that if any such failure should occur, the present Council should continue to hold office until their successors shall be duly appointed.”

The PRESIDENT then called upon the Secretary to read the Annual Report.

ANNUAL REPORT FOR 1880.

The Council, in presenting their usual report, have to congratulate the Society on the satisfactory condition of its affairs, especially as regards the number of members. At the end of December 1880, there was a larger number of *paying* members on its books than there has ever been, with the exception of the year 1874, when there were 312 against 311 of last year.

The total number of elections during the past year has been 46, two of which were cancelled. By withdrawals the Society has lost 10 ordinary members, by death 2, and six by removal under Rules 38 and 40 ; resulting in a net increase of 26. The total number of members at the close



of the year was thus 355. Of these, 30 are absent from India and pay no subscriptions, 112 are Resident, 184 Non-Resident, 15 Foreign, and 14 Life Members.

The following table shows the fluctuations in the number of Ordinary Members for the past 6 years.

YEAR.	PAYING.				NON-PAYING.		TOTAL
	Total.	Resident.	Non-resident.	Foreign.	Life.	Absent.	
1875	292	113	179	..	3	50	345
1876	294	119	175	..	5	48	347
1877	290	113	165	14	9	46	345
1878	285	117	163	15	13	29	327
1879	281	111	154	16	12	36	329
1880	311	112	184	15	14	30	355

During the year two members compounded for their future subscriptions, *viz*, Dr. R. A. Barker and Pandit Mohanlal Vishnulal Pandia, thus raising the number of Life Members to 14.

The following are the names of the members who died during the year:—Honorary Member, Sir J. W. Colville; Corresponding Member, Rev. M. A. Sherring; Ordinary Members, H. L. Dennys and Thakur Giri Prasad Singh. Of these deceased members whose loss the Society has to regret, Sir J. W. Colville had in former times taken a very active part in the management of the Society's affairs, for he was President for 10 years from 1848 to 1858, besides being on the Council for several years previously. Mr. M. A. Sherring had contributed a paper to the Society in 1870 on the Coins of the Sharqi Kings of Jaunpur, and was well known as the author of the "Sacred City of the Hindus," "Hindu Tribes and Castes," &c.

#### Indian Museum.

The only presentation made to the Society, and transferred to the Indian Museum, during the year, was the skin and skull of a specimen of *Lagomys rufescens*, from the Safed Koh Range, forwarded to the Society by Dr. J. E. T. Aitchison.

Mr. J. Crawford tendered his resignation as Trustee of the Indian Museum on behalf of the Society in April, and Mr. A. Pedler was appointed in his place.

Dr. A. F. R. Hoernle and Messrs. Tawney and Beverley have acted as Trustees throughout the year, and Dr. T. R. Lewis up to the time of his resignation as member of the Council, in July.

**Finance.**

The accounts, which will be found in the Appendix, are issued for the first time in a new form. While less voluminous they will be found more complete, as they include the value of the Stock, and show in Statement No. 4 the outstandings, how these have originated, and whether due diligence has been exercised in getting them in.

It will be seen that the Government grants are not only distinctly accounted for, as required by Government, but they form a portion of a general account. As the Society is strictly liable for these funds, no account of the Society's affairs, proper, could be complete without the incorporation of its liabilities on account of these grants; and if the Society had mismanaged these grants, the fact, that the accounts of them were kept absolutely distinct from those of the Society, would not in any way absolve the Society from its responsibility to Government.

The previous system of keeping an absolutely separate account of each grant and one of the Society's affairs was therefore unnecessary and cumbersome; Statements 4, 7, and 8 are general and state the Society's affairs completely.

The establishment employed, an Accountant and a Cashier, has been reduced to one man only, whereby a saving of about Rs. 30 a month has been effected. The large Cash balance formerly kept has been reduced by the surplus being invested; this has increased the Society's income, at present, by about 450 Rupees a year. The rules prescribe that the investments be kept in two separate funds termed a permanent and a temporary fund. Admission and commutation fees were kept in a separate bank account, and the rules prescribe they be invested as soon as possible after receipt thereof. Trust funds were also kept in separate bank accounts, and the servants' pension fund separately invested.

This complicated way of dealing with these matters is quite unnecessary with complete accounts, and it has the serious objection of introducing complications which hinder clear statements and proper checking of the accounts. Nor does this complication afford any additional security or other advantage. All that is necessary is to keep the Cash balance low and the investments as high as possible, raise the amount prescribed as a permanent reserve fund as deemed desirable, and if it be desired that commutation and admission fees be added to the permanent reserve, the Council may annually increase the permanent reserve by at least the amount received during the year under these heads. The complete adoption of these suggestions would require some modification of rules 67, 68, 69 and 70.

(For the annual accounts, see Appendix.)

The following is the estimate for income and expenditure for the year 1881.

## RECEIPTS.

Subscriptions	...	...	...	Rs. 7,500
Sale of Publications	...	...	...	1,500
Admission Fees	...	...	...	1,000
Commutations	...	...	...	300
Interest	...	...	...	6,000
				<hr/>
				Rs. 16,300

## EXPENDITURE.

Salaries	...	...	...	Rs. 4,250
Printing	...	...	...	3,850
Plates	...	...	...	2,460
Books	...	...	...	1,700
Binding	...	...	...	500
Building	...	...	...	300
Pensions	...	...	...	186
Taxes	...	...	...	780
Freight	...	...	...	50
Meeting charges	...	...	...	100
Periodicals purchased locally	...	...	...	60
Lighting	...	...	...	80
Stationery	...	...	...	300
Contingencies	...	...	...	400
Postage	...	...	...	500
Furniture	...	...	...	50
Commission	...	...	...	250
				<hr/>
				Rs. 15,816

## London Agency.

Messrs. Trübner and Co.'s account, rendered up to the end of 1879, showed a balance due from the Society of £72-8-3½. The sale of the Society's publications amounted to £62-4-0, and of the Bibliotheca Indica to £40-10-0.

During the year 1880, twenty invoices were received from Messrs. Trübner of books purchased and of publications of different Scientific Societies sent in exchange. The value of the books purchased amounted to £107-12-8.

The number of copies of parts of the *Bibliotheca Indica*, Journal and Proceedings sent to England for sale amounted to 1803. Of the *Bibliotheca Indica* 687 were despatched, of the Journal 832, and of the Proceedings 284.

In consequence of the reduction in the postal rates, the Council have decided in future to send all publications, intended for Societies and Members in Europe, by post instead of through Messrs. Trübner and Co.

#### **Library.**

The additions to the Library numbered 1619 volumes or parts of volumes; 784 of which are presentations and 835 purchases.

The Council have much pleasure in announcing that the manuscript Catalogue of the books in the Library is now ready, and that arrangements are being made for printing it. In last year's report it was stated that the Assistant Secretary had done about one fourth of the work of revision. As the Council found that, owing to the pressure of current work, the Assistant Secretary could give but little of his time to the Catalogue, arrangements were made with Mr. Dreyer of the Indian Museum to complete it for Rs. 600.

Copies will be supplied gratis to members and to the Societies with whom the Society exchanges publications.

The Library itself has been put into better order, and four new book cases have been purchased for Rs. 1000.

The state of the Oriental Department of the Library has been investigated by a special Committee appointed for the purpose, consisting of C. H. Tawney, Esq., Dr. R. L. Mitra, Major H. S. Jarrett, Babu P. C. Ghosha, the President and the Secretaries.

A Pandit and a Munshi have been engaged temporarily on Rs. 35 a month each, to catalogue and arrange the books and MSS., so as to make this Department of the Library more accessible to members than it has hitherto been.

#### **Publications.**

Four numbers of Part I of the Journal have been published during the year, consisting of 218 pages, with 22 plates and two maps; also the 4th number of this part for 1879, consisting of 43 pages, with 12 plates.

An extra number of this part of the Journal has also been published, being a Turki Vocabulary by the late Mr. R. B. Shaw with an appendix by Dr. J. Scully giving a list of Turki names of Birds and Plants. This number consists of 226 pages.

Three numbers of the second part of the Journal have been published comprising 180 pages of letter press and 11 plates; and the 4th number completing the Volume, is to be issued in a few days. No number 4 of this part for 1879 was published.

Of the Proceedings, 10 numbers have been issued, amounting to 211 pages with 10 plates.

The stock of the Society's publications and of the works belonging to the Bibliotheca Indica Series has been taken. This has been a very troublesome and heavy work as it has not been attempted for years, and the parts of the different books had to be sorted and arranged before the number of copies of each could be ascertained. The stock in the Society's possession has been shown to be much greater than anticipated, and several copies of old works, which were thought to be completely out of stock, have been brought to light. A new list of books for sale will shortly be printed. The stock amounts to about 2,05,700 separate numbers or fasciculi, representing about 162 different works or volumes of the Journal, Proceedings, &c.

#### **Building.**

The amount spent on repairs during the year was Rs. 343-4-0. Four beams had to be changed at a cost of Rs. 112, and Rs. 55 were spent by the Society in substituting 4 iron pillars for the stone ones formerly supporting the staircase.

#### **Coin Cabinet.**

There has been a very large number of additions during the year under review; altogether 247. Only four among these, however, were purchased; the remainder, 243 were presentations.

The four coins which were purchased are gold mohurs, one of Jalal-ud-din Feroz Sháh bin Tughlaq. They were obtained from the Magistrate of Budaon under the Treasure Trove Act.

Among the presentations there are four silver (one of Ala-ud-din Muhammad Sháh, the others illegible) and 29 copper coins from Lieut. R. C. Temple, B. S. C., found at a village called Holawali. Also ten gold Viraraya Fanams, part of a Treasure Trove discovered in the Chingleput District, and 200 small lead coins, found in the village of Narsaraopet, from the Madras Government.

#### **Secretary's Office.**

Dr. A. F. R. Hoernle, and Mr. J. Wood-Mason have held the posts of Philological and Natural History Secretaries, respectively, throughout the year.

Mr. J. Crawford resigned the General Secretaryship in April, and Mr. A. Pedler was appointed in his place.

Mr. Beverley resigned the Treasurership in April, and was succeeded by Mr. J. C. Douglas.

Mr. W. A. Bion has continued to hold the post of Assistant Secretary, and has given much satisfaction by the diligent and zealous discharge of

his duties. Mr. E. S. Andrews has held the post of Assistant Librarian and has also given satisfaction.

During the year the establishment has been reduced by two men. The services of Babus Kedarnath Bysack, Cashier, and Jogendranath Mitra, Store-keeper, were dispensed with ; the former appointment being given to Babu Ram Jivana Mukerjea, the Assistant Cashier, and the posts of Assistant Cashier and Store-keeper were abolished. After the dismissal of the old Cashier, Babu Ram Jivana Mukerjea, his successor, worked for some months under the direct supervision of Mr. Douglas, the Treasurer. During this time the office was virtually without a Cashier, most of the Cashier's work being done by the Assistant Secretary. Notwithstanding this additional work and the reduction in the establishment, the Assistant Secretary and his assistants have done much in putting the Library, the Records, &c. of the Society into better order.

To put the stock and the accounts into proper order, two temporary hands have been employed, who have now finished taking stock of and arranging the Society's and the Bibliotheca Indica publications. A Babu has also been engaged temporarily in indexing the old records of the Society so as to facilitate reference to them.

#### Bibliotheca Indica.

In the two Series together twenty-three fasciculi were published during the year ; eight in the Persian and fifteen in the Sanskrit. They belong to eleven different works, of which two in the Sanskrit Series, have been completed and three, two in the Sanskrit, and one in the Persian Series, have been commenced. The former are the *Bhamati*, and the *Gobhiliya Sūtra* ; the latter are the *Kathā Sarit Sāgara*, the *Prākṛita Lakṣhaṇa*, and the *Tarikh ul Khulfa*.

Among these publications, there are four English translations ; the remaining seven are text editions. The former are the translations of the *Tabaqāt-i-Nāṣirī*, and of the *Tarikh-ul-Khulfa*, both in the Persian Series ; and of the *Kathā Sarit Sāgara* and the *Prithi Rāj Rāsau*, both in the Sanskrit Series. Of the text editions, one belongs to the Persian and six belong to the Sanskrit Series.

#### A. Persian Series.

1. Of the *ISĀBAH* or Biographical Dictionary of persons that knew Muhammad, by Ibn Hajar, one fasciculus has been issued by Moulvie Abdul Hai, Head Professor of the Calcutta Madrassah, after an interruption of three years.

2. Major H. G. Raverty has brought out two fasciculi of his annotated English translation of the *TABAQĀT-I-NĀṢIRĪ*. There is yet one more fasciculus remaining, which will complete this valuable work.

3. Major H. S. Jarrett has published five fasciculi of his annotated English translation of the *TARÍKH-UL-KHULFA* or the *History of the Caliphs* by Jaláluddín As Suyúti.

*B. Sanskrit Series.*

4. Paṇḍit Bála Śāstrí of the Benares College has issued the eighth fasciculus of the *BHAMATI*, which is a gloss on Śankara Achárya's commentary on the *Brahma Sūtras* by Váchaspati Miśra. This concludes the work.

5. Paṇḍit Chandra Kánta Tarkálankára has published the twelfth fasciculus of the *GOBHILÍYA GRÍHYA SÚTRA* accompanied by a commentary compiled by himself. This work also is now completed.

6. Dr. Rájendralála Mitra has brought out three fasciculi of the *VAJU PURÁNA*. This is a sort of Cyclopædia of Sanskrit Literature, and is the second of that class of works for the publication of which the Society is indebted to the learned Editor. The other is the *Agni Purána*, the most ancient and most authentic of that kind of Sanskrit books, the edition of which was completed last year.

7. The text of the *MÍMÁNSÁ DARŚANA* which is edited by Paṇḍit Moheśachandra Nyáyaratna, the Principal of the Sanskrit College, has been advanced by one fasciculus. This work is a critical commentary on the ritual of the *Veda* accompanied by the commentary of Śavara Svámin.

8. Of the *PRÁKRITA LAKSHAṆA* the first fasciculus has been issued by Dr. A. F. Rudolf Hoernle. It contains the text of a Grammar of the ancient *Prákrit* by Chaṇḍa, together with a critical Introduction and Analysis. Another fasciculus, containing an annotated English translation, will complete the work.

9. By the same editor the first fasciculus has been published of his annotated English translation of the *PRITHI RÁJA RÁSAU*, the famous epic of Chand Bardái in old Hindi.

10. Among the works, the forthcoming publication of which was announced in the Annual Report of last year, is the English translation with notes of the *KATHÁ SARIT SÁGARA*, or the *Océan of the Streams of Story*, by Mr. C. H. Tawney, M. A., Principal of the Presidency College. The first volume consisting of six fasciculi has now been published. A second volume completing the work, will probably appear in the course of the current year. This work is the celebrated repository of Indian legends which was composed from older sources by Somadeva of Kashmir towards the close of the eleventh century. The stories are illustrated by notes which refer to similar legends current in other collections of folklore.

11. Another of the new publications is the *NIRUKTA*, the well known glossarial explanation of obscure Vedic terms, of which Paṇḍit Satyavrata Sāmaṣramī has issued the first fasciculus, accompanying the text with extracts from various commentaries.

Besides the above named eleven works, there are in course of preparation the following new ones :

1. The *VISHṆU SMṚITI*, by Professor Jolly of Würzburg, containing the text and extracts from various commentaries.

2. The *ĀPASTAMBA ŚRAUTA SŪTRA*, by Professor R. Garbe of Königsberg, containing the text accompanied by the commentary of Rudradatta. This is a very rare and important work connected with the Black Yajur Veda. The edition will be based on a collation of two or three complete and several fragmentary manuscripts.

3. An English translation, with notes, of the *CHARAKA*, the oldest Hindu work on medicine, by Dr. Mohendralāla Sarkār.

4. An English translation, with notes, of the *LALITA VISTĀRA*, by Dr. Rājendralāla Mitra, to whom the Society is already indebted for a complete edition of the text of that most ancient and important work on the earlier portion of the life of Buddha.

5. The *YOGA SŪTRA* of Patanjali by Dr. Rājendralāla Mitra, with the commentary of Bhoja Rājā, and an English translation of both the text and commentary ; also with an English commentary compiled by the Editor himself, including short extracts from the commentaries of Vyāsa, Vijñāna Bhikshu and Vāchaspati Miśra. This work will complete the Society's series of the six Darśanas. The texts of four have been already published ; the *Mīmāṃsā* is in a forward state, and the *Yoga* will complete the series.

6. The *BṚHADDĒVATĀ*, by Dr. Rājendralāla Mitra. This is a very interesting metrical work of Saunaka on the deities invoked in the hymns of the Ṛig Veda. The edition will be founded on five MSS.

On the other hand, the *MAITRĀYAṆI SAMHITĀ*, the forthcoming publication of which, by Dr. L. v. Schroeder, was announced in the annual report of last year has, with the permission of the Society, been withdrawn from the list of the Bibliotheca Indica by the editor, who intends to publish it in Germany.

Also the *MAGHĀZĪ EL WĀQIDĪ*, the edition of which was begun by Von Kremer many years ago and was to have been completed by Mr. C. J. Lyall, in conjunction with Dr. Wright of Cambridge (see Proceedings, May 1880, p. 88), has been withdrawn from the Bibliotheca Indica in favour of a complete edition of the work which is to be brought out in Germany and will be founded, among others, on two complete and very ancient MSS. in the British Museum.



The following is a detailed list of the publications issued during 1880:

*Persian Series.*

1. ISÁBAH, edited by Moulvie Abdul Hai, of the Calcutta Madrassah, No. 242, Fasc. XVIII (old series).
2. TABAQÁT-I-NÁŞIRÍ, by Abú 'Umr-i-'Ugmán, translated by Major H. G. Raverty, Nos. 392, 393, Fasc. XI and XII.
3. TARÍKH-UL-KHULFA, or, History of the Caliphs, translated by Major H. S. Jarrett, Nos. 440, 441, 443, 446, 451, Fasc. I to V.

*Sanskrit Series.*

4. BHAMATI, a Gloss on Śankara Achárya's Commentary on the Brahma Sūtras by Váchaspati Miśra, edited by Paṇḍit Bála Śástrí, No. 433, Fasc. VIII.
5. GOBHILÍYA GRÍHYA SÚTRA, with a Commentary by the editor, edited by Chandra Kánta Tarkálankára, No. 448, Fasc. XII.
6. VAYU PURÁṆA, a system of Hindu Mythology and tradition, edited by Dr. Rájendralála Mitra, C. I. E., Nos. 434, 437, 445; Fasc. IV, V and VI.
7. MÍMÁMSÁ DARŚANA, with the Commentary of Śavara Svámin, edited by Paṇḍit Moheśa Chandra Nyayaratna, No. 435, Fasc. XV.
8. PRÁKRITA LAKSHANA, or Chaṇḍa's Grammar of the Ancient Prákrit, edited by Dr. A. F. Rudolf Hoernle, No. 447, Fasc. I.
9. PRITHIRÁJ RÁSAU, of Chand Bardái, translated from the old Hindi, by Dr. A. F. Rudolf Hoernle, No. 452, Fasc. I.
10. KATHÁ SARIT SÁGARA, or, Ocean of the Streams of Story, translated from the Sanskrit by C. H. Tawney, M. A., Nos. 436, 438, 439, 442, 444, 450, Vol. I, Fasc. I—VI.
11. SABHÁSHYAVRITTI NIRUKTA, with commentaries, edited by Paṇḍit Satyavrata Sámaśramí, No. 449, Fasc. I.

*List of Societies and Institutions with which Exchanges of Publications have been made during 1880.*

- Amsterdam :—Royal Zoological Society.  
 Batavia :—Batavian Society of Arts and Sciences.  
 Berlin :—Royal Academy.  
 Berne :—Swiss Entomological Society.  
 Bombay :—Bombay Branch, Royal Asiatic Society.  
 — :—Editor, Indian Antiquary.  
 Boston :—Natural History Society.  
 Bordeaux :—Bordeaux Academy.  
 — :—Linnean Society.

- Buenos Ayres :—Public Museum.  
 Brussels :—Royal Academy of Sciences.  
 ——— :—Geological Society of Belgium.  
 Calcutta :—Agricultural and Horticultural Society of India.  
 ——— :—Geological Survey of India.  
 Cassel :—Natural History Society.  
 Cherbourg :—National Society of Natural Science.  
 Christiana :—University Library.  
 Copenhagen :—Royal Society of Northern Antiquaries.  
 Cambridge :—University Library.  
 Colombo :—Royal Asiatic Society, Ceylon Branch.  
 California :—Californian Academy of Arts and Sciences.  
 Dehra-Dun :—Great Trigonometrical Survey.  
 Dublin :—Royal Dublin Society.  
 ——— :—Royal Irish Academy.  
 Edinburgh :—Royal Society.  
 Geneva :—Physical and Natural History Society.  
 Genoa :—Museum of Natural History.  
 Königsberg :—Physical and Economical Institution.  
 Leipzig :—German Oriental Society.  
 Leyden :—Royal Herbarium.  
 Liège :—Royal Society of Sciences.  
 London :—Royal Society.  
 ——— :—British Museum.  
 ——— :—Royal Asiatic Society of Great Britain and Ireland.  
 ——— :—Royal Institution.  
 ——— :—Institution of Civil Engineers.  
 ——— :—Institution of Mechanical Engineers.  
 ——— :—Royal Geographical Society.  
 ——— :—Zoological Society.  
 ——— :—Statistical Society.  
 ——— :—Geological Society.  
 ——— :—Linnean Society.  
 ——— :—Anthropological Institute.  
 ——— :—Royal Astronomical Society.  
 ——— :—Royal Microscopical Society.  
 ——— :—Editor, Academy.  
 ——— :—Editor, Athenæum.  
 ——— :—Editor, Nature.  
 ——— :—Society of Telegraph Engineers.  
 Lyon :—Agricultural Society.  
 ——— :—Natural History Society.

- Lyon :—Museum of Natural History.  
 Madras :—Literary Society.  
 Manchester :—Literary and Philosophical Society.  
 Moscow :—Société des Naturalistes.  
 Munich :—Royal Academy.  
 Netherlands :—Royal Society.  
 New Haven, U. S. :—Connecticut Academy of Arts and Sciences.  
 New South Wales :—Royal Society.  
 Oxford :—Bodleian Library.  
 Paris :—Imperial Library.  
 — :—Anthropological Society.  
 — :—Asiatic Society.  
 Paris :—Geographical Society.  
 — :—Zoological Society.  
 Philadelphia :—Academy of Natural Science.  
 Pisa :—Tuscan Society of Natural Sciences.  
 Simla :—United Service Institution of India.  
 Stettin :—Entomological Society.  
 Stuttgart :—Natural History Society of Württemberg.  
 St. Petersburg :—Imperial Library.  
 — :—Imperial Russian Geographical Society.  
 — :—Imperial Academy of Sciences.  
 — :—Imperial Botanical Gardens.  
 Stockholm :—Royal Academy of Sciences.  
 Trieste :—Adriatic Society of Natural Science.  
 Turin :—Academy.  
 U. S., America. :—Geological Survey of the Territories.  
 Vienna :—Imperial Geological Institute.  
 — :—Anthropological Society.  
 — :—Imperial Academy of Sciences.  
 — :—Zoological Society.  
 Washington :—Smithsonian Institution.  
 — :—Commissioners of the Department of Agriculture.  
 Yokohama :—German Oriental Society.  
 — :—Asiatic Society of Japan.  
 Zagreb :—Archæological Society.

or expressing their willingness to allow themselves to be nominated members of the Council for 1880.

The Council sanctioned the recommendation of the Secretary that slám Khán's pension should be continued for life, and ordered that all such pensions should be paid from the Piddington Pension Fund.

The recommendation of the Finance Committee that one of the collecting Sircars should be discharged, and that the other should be retained on a commission of 5 per cent., was agreed to.

The programme for the Annual Meeting and the Annual Report were read and approved.

*February 26th, Ordinary Meeting.*

The Members of the Finance and other Committees were elected.

Mr. C. H. Dreyer's offer to complete the Library Catalogue for Rs. 600 was accepted.

Dr. A. F. R. Hoernle's proposals with regard to the rates paid for printing and editing the Bibliotheca Indica were agreed to, with an amendment proposed by Dr. Mitra, that the rate at which editing work is to be paid for be fixed simply as it is difficult or easy. It was also directed that Dr. Hoernle's memorandum on the subject should be printed for the use of the Council and of the Finance Committee.

The recommendation of the Finance Committee that 2 pairs of book-cases should be purchased for Rs. 1,000 was ordered to be referred back to the Committee for reconsideration with the annual accounts.

*April 1st, Ordinary Meeting.*

A letter was read from the Superintendent, Baptist Mission Press, asking if the printing of the Isabah is to be continued; also a minute by Dr. Hoernle recommending that the work should be continued, and stating that Mr. O'Kinealy had kindly offered to superintend its printing. The minutes of the Council on a memorandum by the Philological Secretary on the affairs of the O. P. Fund were also read. After a prolonged discussion on the advisability of adopting the proposals made by the Philological Committee for regulating the selection of works for publication in the Bibliotheca Indica, it was resolved that formal sanction should be given to the publication of nine works (the names of which have been given in the Proceedings for May 1880), and that it should be left to the Philological Secretary to determine the rate at which each should be published.

An exchange of publications with the Stockholm Academy of History and Antiquities was sanctioned.

*April 29th, Ordinary Meeting.*

On the resignation of Mr. J. Crawford, Mr. A. Pedler was elected Member of Council, General Secretary and Trustee of the Indian Museum.

A memorandum by the President on the advisability of increasing the number of the Council was read, and the proposed alteration was agreed to. The necessary modifications in the rules were ordered to be proposed at the next meeting of the Society.

An exchange of Part I of the Journal for the Zagreb Archæological Society's publications was agreed to.

The Philological Secretary submitted a statement of rules and rates connected with the publication of the Bibliotheca Indica, Journal and Proceedings, which he had prepared for the press in accordance with the order of Council. Fifty copies were ordered to be printed.

The rates of remuneration at which the newly appointed editors of the Bibliotheca Indica are to be paid were agreed upon. As Mr. C. H. Tawney refused to accept any remuneration, it was ordered that he should be presented with 30 copies of his work.

The Philological Secretary reported that he had made over the printing of Mr. Dames's Baloochi Grammar to the Baptist Mission Press, and that he had written to the Bombay and Punjab Governments asking for aid in printing the work.

The Philological Secretary was asked to institute an enquiry as to whether it was necessary to have a person in charge of the vernacular portion of the Library and to report at a future meeting.

On the resignation of Mr. Beverley as Treasurer and Mr. H. F. Blanford as Member of Council, Mr. J. C. Douglas was elected Member of Council and Honorary Treasurer.

*May 29th, Ordinary Meeting.*

An exchange of publications with the Linnean Society of Bordeaux and with the United Service Institution of India was sanctioned.

Letters were read from the Secretaries to the Governments of Bombay and of the Panjab subscribing for 5 and 50 copies respectively of Mr. Dames's Baloochi Grammar. A letter was directed to be written to the Secretary to the Foreign Department, Government of India, asking Government to subscribe for copies of the same work.

An order was passed that books from the Library should be issued on the requisition of the officer in charge of the Surveyor General's Office, Calcutta, on the same terms as to Members.

A recommendation of the Finance Committee that in future their Meetings should be held on the 4th of each month, except when that date falls

on a Saturday, Sunday or Monday, when the meeting should be held on the following Tuesday, was agreed to.

It was ordered that the Society's accounts should be kept according to the plan suggested by Mr. Douglas, and a temporary clerk was appointed on Rs. 15 a month to help in preparing the accounts.

*July 1st, Ordinary Meeting.*

The Minutes of the Council were read on a memorandum by Dr. R. Mitra on the state of the Oriental Library. A Committee was appointed (1) to enquire whether MSS. and books to the extent indicated in Dr. Mitra's Memo. have disappeared and to ascertain, if possible, in what way this loss has occurred, (2) to report how far the MSS. have been catalogued, and (3) to suggest suitable arrangements for the safe custody of the MSS. in the future.

*July 29th, Ordinary Meeting.*

A letter was read from the Secretary to the Government of India, Foreign Department, subscribing for 40 copies of Mr. Dames's Baloochi Grammar.

A letter was read from Dr. T. R. Lewis tendering his resignation as Member of the Council, and it was resolved that Mr. H. F. Blanford should be re-appointed Member of Council in his place.

A letter was read from the Private Secretary to the Viceroy, stating that Lord Ripon accepts the post of Patron of the Society.

An exchange of the Proceedings for the publications of the Cassel Society of Natural History was sanctioned, and an application from the Editor of the *Zeitschrift für Wissenschaftliche Geographie*, for an exchange, was declined.

The recommendation of the Oriental Library Committee to appoint temporarily a Munshi and Pandit each on Rs. 35 per mensem, was agreed to.

*August 26th, Ordinary Meeting.*

Mr. R. W. Nicholson, Lt.-Col. M. G. Clerk, Babus Benod Behary Mullick and Sib Chunder Nag and Khalif M. Hassan were elected ordinary members of the Society.

The Minutes of the Council were read on a letter from Dr. R. Mitra forwarding 2 bills for the editing and printing of his Catalogue of the MSS. in the Library of H. H. the Maharaja of Bikaner. It was ordered that Dr. Mitra's letter with the 2 bills should be forwarded to Government; and that, with reference to the paragraph in the preface of the Catalogue in which Dr. Mitra states that he has worked with imperfect materials, Gov-

ernment should be reminded that the correspondence on this subject has already been before them.

*September 30th, Ordinary Meeting.*

Messrs. E. M. Sage, and R. O. Lees were elected Ordinary Members of the Society.

A letter was read from Dr. R. Mitra forwarding 10 copies of his report on the Conservation of Sanskrit MSS. for the past year.

A request from the Proprietor of the "Asian" that the Society should subscribe for his paper was declined.

Dr. Garbe's edition of the text of the *Āpastamba Śrauta Sūtra* was ordered to be substituted, in the list of publications undertaken by the Society, for Dr. Schroeder's *Maitrāyaṇī Saṃhitā*.

*October 28th, Ordinary Meeting.*

A letter from Dr. T. E. Charles, offering translations of the *Nidāna* and *Suśruta* which he has had prepared at his own expense, to the Society if they will undertake to publish them, was ordered to be referred to the Philological Committee.

An application from the Natural History Society of Brunswick, for an exchange of publications, was declined.

The Secretary submitted the report of the Sub-Committee appointed to investigate the condition of the Oriental Library. It was ordered to be circulated to the Members of the Council.

*November 25th, Ordinary Meeting.*

An exchange of publications with the Royal Dublin Society was sanctioned.

On the recommendation of Mr. H. Rivett-Carnac it was ordered that abstracts of the proceedings at the meetings of the Society should be published in the daily papers.

Babu Thakur Dass Banerji was appointed on trial, on Rs. 30 per mensem, to do the work of indexing the old records of the Society.

It was agreed that all the Journals and Proceedings previously distributed through Messrs. Trübner & Co. should be sent direct by post for the future.

A pension of Rs. 15 per mensem was allowed to Babu Buddhinath Bysack, the Society's old Cashier.

*December 20th, Ordinary Meeting.*

A letter was read from Mr. H. G. Keene announcing the near completion of Beal's Oriental Biographical Dictionary.

A memorandum by Dr. Mitra was read stating that, in their present condition, the translations of the *Suśruta* and *Nidāna* offered by Dr. Charles are unfit for publication, and suggesting that they should be made over to Dr. Uday Chand Dutt for the purpose of editing and revision. It was ordered that the result of Dr. Mitra's investigations should be communicated to Drs. Harvey and Smith, who have been requested by Dr. Charles to act for him in this matter.

The thanks of the Society were ordered to be conveyed to the Oriental Library Committee and to its Secretary for the valuable report submitted by them.

It was ordered that Babu Thakur Dass Banerji should continue indexing the Society's old records.

The Catalogue of the books in the Library, as completed by Mr. Dreyer, was submitted.

The **PRESIDENT** then delivered the following address :

"I hope the meeting will agree with me in thinking the report a satisfactory one, showing that the affairs of the Society have made good progress during the past year. There has been a large addition to the list of members ; the catalogue of the Library is ready to go to press ; and the reorganisation of our accounts is an accomplished fact. Last year I mentioned the trouble Mr. Westland had taken to re-cast our system of book-keeping. The greater labour of carrying out the reformation devolved upon our present Treasurer, who further modified the proposed system and brought it into successful operation, as may be judged by the financial statement attached to the report. The Society is under much obligation to Mr. Douglas for the time and skill he has devoted to its service. Our Honorary Secretaries have been no less diligent in the performance of their editorial and administrative functions, and I would ask you to convey to those gentlemen the gratitude of the Society, by a vote of thanks."

A vote of thanks to the Officers of the Society was unanimously carried.

At the suggestion of the President—

Mr. J. Westland and Col. Sconce were appointed to audit the annual accounts.

The Meeting was then resolved into the Ordinary Monthly General Meeting.

H. B. MEDLICOTT, Esq., F. R. S., President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Home, Revenue and Agricultural Department,—(1) a Catalogue of Sanskrit MSS. in the Library of H. H. the Maharāja of Bika-



neer, by Dr. R. L. Mitra ; (2) Notes on Afghanistan and part of Piluchistan, by Major H. G. Raverty.

2. From M. de Goeje,—(1) *Kitabo 'l Ahdád*, by M. Houtsma, (2) *Al Moschtabih*, by Dr. P. de Jong.

3. From the author,—*Grammar of the Classical Arabic Language*, Parts II and III, by M. S. Howell.

4. From the Meteorological Reporter to the Government of India,—*Report on the administration of the Meteorological Department of the Government of India, 1879-80*, by H. F. Blanford.

5. From the Assistant Secretary, P. W. D., British Burmah,—*Report on the Irrawady river*, by R. Gordon.

6. From Dr. G. Leitner,—*Proceedings of the Anjuman-i-Punjab during October, November and December 1880*.

The following Gentlemen, duly proposed and seconded at the last meeting, were balloted for and elected Ordinary Members :—

P. I. Carter, Esq.

Captain T. Morris Jenkins.

Major W. F. Prideaux.

R. C. Laughlin, Esq.

Dr. G. Bomford.

The following are candidates for ballot at the next meeting :

1. Sir Ashley Eden, K. C. S. I., Lieutenant-Governor of Bengal (re-election), proposed by the President, seconded by the Secretary.

2. H. J. Reynolds, Esq., C. S., proposed by the President, seconded by the Secretary.

3. L. King, Esq., Assistant Commissioner of Rohtuk, proposed by Col. C. Minchin, seconded by M. Macauliffe, Esq.

4. F. C. Channing, Esq., C. S., Lahore, proposed by D. Ibbetson, Esq., seconded by A. Pedler, Esq.

5. E. R. Shopland, Esq., Post Master, Akyab, proposed by L. Schwendler, Esq., seconded by A. Pedler, Esq.

6. Captain L. A. C. Cook, 5th Bengal Cavalry, Jamrud, proposed by J. G. Delmerick, Esq., seconded by A. Pedler, Esq.

7. Babu Hem Chunder Gossain, Calcutta, proposed by A. Pedler, Esq., seconded by the Hon'ble P. M. Mukerjea.

8. W. C. Benett, Esq., C. S., Rai Bareilly, proposed by H. Rivett-Carnac, Esq., seconded by Dr. G. Thibaut.

9. Babu Troylokyanath Mitra, B. L., 1st Subordinate Judge, Jessore, proposed by Babu Adharlal Sen, seconded by A. Pedler, Esq.

10. Babu Bhyrub Chunder Chatterjea, Special Sub-Registrar, Jessore, proposed by Babu Adharlal Sen, seconded by A. Pedler, Esq.

11. J. Bridges Lee, Esq., M. A., F. G. S., F. C. S., F. Z. S., proposed by A. Pedler, Esq., seconded by C. H. Tawney, Esq.

12. Babu Peary Mohun Guha, B. L., Pleader, Jessore, proposed by Babu Adharlal Sen, seconded by Dr. R. L. Mitra.

13. Babu Sreenath Chunder, proposed by W. Swinhoe, Esq., seconded by Babu P. C. Ghosha.

The SECRETARY reported that Mr. W. Lambe had intimated his desire to withdraw from the Society.

Mr. J. C. DOUGLAS then exhibited the working of the Gower Bell Telephone, and explained the principles on which it is constructed.

Dr. HOERNLE exhibited and described 10 coins, the property of Mr. R. Nicholson of the Opium Department, sent for the inspection of the Society by Mr. H. Rivett-Carnac, B. C. S. These coins consist of (1) three silver Bactrian hemidrachmas, one of Azilises and two of Zoilos; very similar to those described in Prinsep's *Indian Antiquities*, Vol. II, pp. 190, 211. One of the two Zoilos is of the degraded type, noticed in the *Journal A. S. B.*, Vol. XXIII, p. 692 (Plate XXXV, No. 11) and in the *Numismatic Chronicle*, Vol. X, p. 72. (2) One gold Kumára Gupta; as in Prinsep's *Ind. Ant.*, Vol. I, p. 386 (Class II, a); the legends are: *Obv.*, above the bow *śra* (*śrī?*) *má*; below the arm *ku*; to the right, along the rim, *śrī* ..... (rest illegible). *Rev.*, along right-hand rim, *kumára guptádhirāja*; the letter *dhi* is doubtful. (3) Three silver Kumára Gupta coins of the Sáh series and the peacock type; similar to those described by E. Thomas in the *Archæological Survey of Western India*, p. 65 (Plate VII, Nos. 22-25); two, however, show traces of date-figures in front of the profile, doubtfully read as 1...5. (4) A gold coin (unknown to the exhibitor) showing, on the *obverse*, a bull sitting in front of a Mahádeva (as *linga-yoni*), below them the recumbent figure of a man, dressed in short dhoti; legend in Kutila characters *śrī dhairyyarāja*. *Reverse*: cow with sucking calf; below, a cluster of seven dots; in front, a water-vessel (*sarái?*) and a fish; above, a wheel and some other indistinguishable



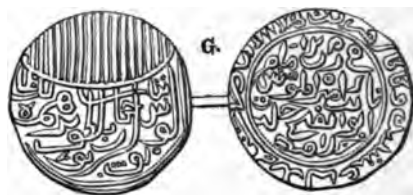
symbols as shown in the woodcut. (6) A gold mohur of the Jaunpur Sultán Ibráhím Sháh Sharqí; dated 823 A. H., apparently similar to the one, noticed by E. Thomas in *Chronicles of the Pathán Kings of Delhi*, p, 321. Legend:—

*Obv.* في زمن الامام  
نائب امير المؤمنين  
ابو الفتح خلدة  
خلافة

*Margin:* ضربت هذا الدينار  
في سنة ثلثة عشرين وثمانائة

*Rev.* الواثق  
بتأييد الرحمان  
ابو المظفر ابراهيم  
السلطان

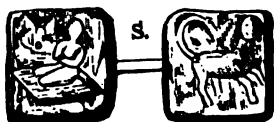
No Margin.



This coin is peculiar on account of the elongated downstrokes of the letters on the reverse, resembling a row of organ pipes. The legend on the obverse is an exact reproduction of that on some of the coins of the Delhi Emperor Feroz Sháh, during whose reign the Jaunpur Sultánat took its rise. (7) A copper coin, the legends of which are too much worn to be distinguished. The head on the obverse has the appearance of being Roman; the figure on the reverse may be Ceres (?), and there appears to be a monogram B.

Dr. Hoernle exhibited and described 12 coins of the later Delhi Emperors. They were selected from a large hoard of 200 coins, found at Nya Doomka in the Santhal Pergunnahs. Among them were four gold mohurs, one of Muhammad Farrukh Sí, dated 1126 A. H., mint Akbarábád, regnal year 2; one of Muhammad Sháh, date 1148 A. H., mint Jahánábád (?) regnal year 18; one of ditto, date 1161 A. H., regnal year 30 (the last of his reign; the latest of his coins, noticed by Marsden in his *Oriental Coins*, p. 669, is four years earlier, of 1157 A. H.); one of Sháh 'Alam, date 1202 A. H., struck by the English Government in Calcutta. The others are silver Rupees of Sháh 'Alam, of various dates, four struck by the English in Calcutta, four other struck by the Nawáb of Oudh. The latter have the symbol (fish) and name of Benares and are dated 1209, 1226, 1223, 1229 A. H.

Dr. Hoernle also exhibited and described two old Hindu coins, found at Sárnáth, near Benares and presented to the Society by Mr. Holniette. One is a small round silver piece of a well known type (see Prinsep's *Ind. Ant.* p. 291) with the legend *Śrīmad Gangeya*. The other is a square silver piece, showing on one side, the figure of a Rájá sitting in the well-known kneeling posture, on a square carpet; on the other side is a lion;



both figures are in a diagonal position, as shown in the woodcut. Dr. Mitra, however, thinks that they are more punch marks of some kind or other which have been destroyed by rust.

Dr. Hoernle exhibited 4 silver coins sent by Rájá Udayapratápa Siñha, through Dr. R. Mitra, who communicated the following remarks regarding them:

"Rájá Udayapratápa Siñha, of Bhinga, Oudh, has sent me four silver coins, out of a large number lately found in his táluk. Three of them are of Husain Sháh, and one of Mahmúd Sháh, both of Jaunpur. They are of a type very similar to the copper coin described by Thomas (*Chronicles of Pathán Kings of Delhi*, p. 322) but not exactly alike. They may be thus described:

"Nos. 1 and 2 silver, weight 141-149 grs.

"Obverse— حسین شاه محمود شاه ابرهیم شاه سلطان خلد

"Reverse— الخلیفه امیر المومنین خلدت ۸۶۶

"The inscription is quite clear, but the edges have been filed away, and some of the words have been lost. I guess the remnant of the word *ibn* before *Ibráhím* in No. 2. The figure 8 in the date is lost in No. 1.

"No. 3 differs from No. 1 in being thinner and smaller; its weight is 56 grains. The inscription is the same, only very much cut off. No date.

"No. 4, silver, weight 53 grains.

"Obverse— محمود شاه ابرهیم شاه سلطان (ني) خلد (ت)

"Reverse. The same as in the first three, but no date.

"As I am not well, and shall not be able to attend the next meeting, will you please exhibit the coins. The typical specimens may be retained for the Society, and the duplicates returned to me."

Dr. Hoernle exhibited some old Hindi inscriptions found in an 'Idgáh, near Monghyr, and sent by Mr. Martin with the following letter :

" I beg to send you a copy of some inscriptions on a stone used as a door-step to an Idgáh at Chewora, Pergunna Amrethu, Zillah Monghyr ; the only thing I can learn about them is that the stone was a part of a house belonging to some Rájá of Behár.

" Inscriptions 1 and 2 are in the positions as they are on the paper, 3 is written in smaller letters under 2, 4 at one side, upside down as marked, 5 also upside down, but rather more to the left of 1, and 6 as on the paper ; the latter is most roughly scratched and is I should say an attempt to cut the word 'Allah' in Urdu. I am sorry I had neither the time or paper for getting a better rubbing."

" If you can kindly inform me to what king &c. the inscriptions refer, I shall be much obliged, also what the words are."

Dr. Mitra, who had read the inscriptions, communicated the following remarks regarding them—

" The inscriptions must have belonged to some Hindu temple whence they have been transferred to the Idgáh. No. 1 I read with absolute certainty.

#### ॐ देव चक्रेयं

" This is a formula which occurs repeatedly at the foot of Buddhist statues, and means " this is dedicated to religion." The name of the donor sometimes precedes and sometimes follows the formula, but not unoften omitted.

" No. 2 gives the name of the donor of the above or of some other object. It reads—

#### जीजवीराकस.

" The *shi* must be read *khi* and the name is *Jakkhika*.

" No. 3 has been very much spoiled by the attempt to trace the outlines of the letters, and the letters therefore are not reliable. I read it—

#### सं १२ ८२ जीह वदि १

" The doubtful letters are 4, 6 and 7. There is no trace of "Allah" in any of the inscriptions."

The following paper was read—

1. *The Phenomenon commonly called the "Cry of Tin."*—By J. C.

DOUGLAS.

If a piece of tin be bent it emits a sound ; this, being regarded as a property peculiar to tin, has been termed "the cry of tin." This phenomenon is explained by the peculiar crystalline structure of the metal. If the

explanation be the true one, then other metals which are obviously crystalline in structure should also exhibit the phenomenon under favourable conditions, but it is exceedingly difficult to place other metals in a crystalline state under proper conditions, *e. g.*, cast iron and cast zinc in thin rods break before they can be bent sufficiently to emit audible sounds, while rolled zinc has had its crystalline structure destroyed by rolling and so is not in a condition to emit sound when bent. Rolled zinc is very tough as compared with cast zinc, and its fracture is not crystalline, but of an even fine-grained bluish tint destitute of the brilliant lustre presented by this metal in a crystalline state. If, however, a piece of rolled zinc be heated for a few minutes to a temperature somewhat below its melting point, the metal becomes much less tough, and its fracture is decidedly crystalline. On bending a piece of zinc so treated it emits a sound weaker than, but of the same nature as, the sound emitted by tin. Cast zinc cannot be bent readily, but if it be pinched between the teeth or with pliers it emits the sound distinctly.

It appears therefore that the cry of tin is due to crystalline structure, that it is not characteristic of tin as generally accepted, but may be emitted by zinc and probably by other metals when crystalline in texture; that rolling in the case of tin and zinc and probably in other cases, destroys the property with the alteration of texture; that in the case of zinc which has been rolled, the crystalline texture may be produced without melting the metal but by merely heating it, and this is so readily done that it affords a ready illustration of the effects of high temperatures on rolled metal. If as supposed this sound is characteristic of the crystalline structure of metals, it may afford a means of great practical use whereby by the sound a metal emits we may draw conclusions as to its texture and hence its fitness for certain purposes, or by the sound emitted by a beam when bent we may draw conclusions as to its safety, the microphone or other appliance being called in to aid us where the sounds are exceedingly weak.

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## LIBRARY.

The following additions have been made to the Library since the meeting held in January last.

## TRANSACTIONS, PROCEEDINGS AND JOURNALS,

*presented by the respective Societies and Editors.*

Bombay. The Indian Antiquary,—Vol. IX, Part CXIII, December 1880, and Vol. X, Part CXIV, January 1881.

Bordeaux. Société de Géographie Commerciale,—Bulletin, No. 24, 1880, and No. 1, 1881.

Calcutta. Registers of Original Meteorological Observations for November and December, 1879.

———. Geological Survey of India,—Memoirs, Vol. XVI, Part 3.

London. Royal Asiatic Society of Great Britain and Ireland,—Journal Vol. XII, Part 4, October 1880.

———. Royal Geographical Society,—Proceedings, Vol. II, No. 12, December 1880.

———. Geological Society,—Quarterly Journal, Vol. XXXVI, Part 4, 1880.

*F. C. J. Spurrell.*—On the discovery of the place where Palæolithic Implements were made at Crayford. *P. H. Carpenter.*—On some new Cretaceous *Comatulæ*.

———. ———. List of Fellows, 1880.

London. Institution of Civil Engineers, —Minutes of Proceedings, Vol. LXII, Part 4, 1879-80.

———. The Academy,—Nos. 450—453.

———. The Athenæum,—Nos. 2773—2776.

———. Nature,—Vol. XXIII, Nos. 581, 583, and 584.

Paris. Société de Géographie,—Bulletin, September and October, 1880.

Washington. United States Geological and Geographical Survey of the Territories,—Bulletin, Vol. V, No. 4.

## BOOKS AND PAMPHLETS,

*presented by the Authors.*

BAIRD, CAPT. A. W. Tide-Tables for the Indian Ports for 1881. 12mo., London.

HOWELL, M. S. Grammar of the Classical Arabic Language. Translated and compiled from the works of the most approved native or naturalized authorities. Parts II—III. Royal 8vo., Allahabad, 1880.

### MISCELLANEOUS PRESENTATIONS.

Proceedings of the Anjuman-i-Panjab. October to December 1880. Fcp., Lahore, 1880.

PRESIDENT, ANJUMAN-I-PANJAB.

JONG, DR. P. DE. *Al-Moschtabih*, auctore Schamso'd-din Abu Abdallah Mohammed ibn Ahmed. 8vo., Lugduni-Batavorum, 1881.

HOUTSMA, M. TH. *Kitábo-'l—Adhdád sive liber de vocabulis Arabicis quae plures habent significationes inter se oppositas* auctore Abu Bekr ibno-'l-Anbári. 8vo., Lugduni-Batavorum, 1881.

M. J. DE GOEJE.

Report on the Cholera Epidemic of 1879 in Northern India, with special reference to the supposed influence of the Hurdwar Fair. Fcp., Calcutta, 1880.

SANITARY COMMISSIONER WITH THE GOVT. OF INDIA.

BLANFORD, H. F. Report on the Administration of the Meteorological Department of the Government of India in 1879-80. Fcp., Calcutta, 1880.

METEOROLOGICAL REPORTER TO THE GOVT. OF INDIA.

GORDON, R. Report on the Irrawaddy River, Parts I, II, III and IV. Fcp., Rangoon, 1879.

PUBLIC WORKS DEPT., B. BURMAH.

Report on the Administration of the Panjab and its Dependencies for 1879-80. Royal 8vo., Lahore, 1880.

PUNJAB GOVERNMENT.

Report on Public Instruction in the Madras Presidency for 1877-78 and 1878-79. Royal 8vo., Madras, 1879.

MADRAS GOVERNMENT.

Report on the Administration of the Customs Department in the Bengal Presidency for the year 1879-80. Fcp., Calcutta, 1880.

Report on Vaccination in the Province of Bengal for 1879-80. Fcp., Calcutta, 1880.

Report on the Internal Trade of Bengal, for the year 1879-80. Fcp., Calcutta, 1880.

Report on the Administration of Bengal, 1879-80. Royal 8vo., Calcutta, 1880.

Records of the Geological Survey of India,—Vol. XIII, Part 4.

BENGAL GOVERNMENT.

The Indian Antiquary, Vol. IX, Part 113, December 1880.

HOME, REVENUE AND AGRICULTURAL DEPARTMENT.



## PERIODICALS PURCHASED.

- Calcutta. Calcutta Review,—No. 143, January 1881.  
 ———. Stray Feathers,—Vol. IX, No. 4.  
 ———. Indian Medical Gazette,—Vol. XVI, No. 1, January 1881.  
 Supplement.  
 Geneva. Archives des Sciences Physiques et Naturelles,—Vol. IV, No. 12, December 1880.  
 Giessen. Jahresbericht über die Fortschritte der Chemie, Part 2 of 1879.  
 Göttingen. Gelehrte Anzeigen,—No. 52, 1880, and Nos. 1-2, 1881.  
 Leipzig. Annalen der Physik und Chemie,—Vol. XI, Part 4.  
 ———. ———. Beiblätter,—Vol. IV, Part 12.  
 London. Philosophical Magazine,—Vol. X, No. 64, December 1880.  
 ———. The Entomologist's Monthly Magazine,—Vol. XVII, No. 199, December 1880.  
 ———. The Entomologist,—Vol. XIII, No. 211, December 1880.  
 ———. The Ibis,—Vol. IV, No. 16, October 1880.  
*Sclater, P. L.*—Remarks on the present state of the *Systema Avium*. *Vogt, C.* *Archæopteryx macrura*, an intermediate form between Birds and Reptiles.  
*Gurney, J. H.*—Notes on a 'Catalogue of *Accipitres* in the British Museum', by R. B. Sharpe (1874).  
 ———. Messenger of Mathematics,—Vol. X, No. 7, November 1880.  
 ———. Journal of Botany,—Vol. IX, No. 216, December 1880.  
 ———. Annals and Magazine of Natural History,—Vol. VI, No. 36, December 1880.  
*Günther, Dr. A.*—Description of *Ophites japonicus*, a new Snake from Japan.  
 ———. Journal of Science,—Vol. II, No. 84, December 1880.  
 London. Numismatic Chronicle,—Vol. XX, Part 3, 1880.  
 ———. Society of Arts,—Journal, Vol. XXIX, Nos. 1465—1468.  
 ———. The Publishers' Circular,—Vol. XLIII, Nos. 1039—1039.  
 ———. Chemical News,—Vol. XLII, Nos. 1099—1101.  
 New Haven. American Journal of Science,—Vol. XX, No. 119, November 1880.  
 Paris. Comptes Rendus,—Vol. XCI, Nos. 23-26.  
 ———. Revue Critique,—Vol. X, Nos. 50-52, Vol. XI, No. 1.  
 ———. Revue des deux Mondes,—Vol. XLII, Part 4, and Vol. XLIII, Part. 1.  
 ———. Journal des Savants, December 1880.  
 ———. Revue Scientifique,—Vol. XLX, Nos. 25-26; and Vol. XX, No. 1.

## BOOKS PURCHASED.

GEIKIE, JAS. Prehistoric Europe. Roy. 8vo., London, 1881.

HUME AND MARSHALL. Game Birds of India, Burmah and Ceylon. Vol. III. Roy. 8vo., Calcutta, 1881.

MUELLER, MAX. Sacred Books of the East,—Vol. VI, The Qur'an, Part I, and Vol. IX, The Qur'an, Part II. 8vo., Oxford, 1880.

SCHLIEMANN, DR. H. Ilios; The City and Country of the Trojans. Roy. 8vo., London, 1880.





PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
FOR MARCH, 1881.

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The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 2nd March, 1881, at 9 P. M.

C. H. TAWNEY, Esq., M. A., Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Marine Survey Department,—A List of Light-Houses and Light-Vessels in British India, by R. C. Carrington.

2. From the K. B. Akademie der Wissenschaften zu München,—(1) Das Haus Wittelsbach und seine Bedeutung in der deutschen Geschichte, by J. v. Döllinger, (2) Ueber den geologischen Bau der libyschen Wüste, by Dr. K. A. Zittel, (3) Die Pflege der Geschichte durch die Wittelsbacher, by Dr. L. Rockinger.

3. From the Palæographical Society,—Facsimiles of Ancient MSS., Oriental Series, Part V, by W. Wright.

4. From the Surveyor General of India,—(1) Account of the Operations of the Great Trigonometrical Survey of India, Vol. VI, (2) Synopsis of the Results of the Operations of the Great Trigonometrical Survey of India, Vol. VII.

5. From the authors,—(1) Report on the Electric Light at the East Indian Railway Company's Station, Howrah (Calcutta), by L. Schwendler, (2) Sketch of the Hindustani Language, by C. J. Lyall.

6. From the Home, Revenue and Agricultural Department,—the Sacred Books of the East, Vols. VI and IX, edited by F. Max Müller.

7. From Mr. Holguette,—one silver and one copper coin.

8. From Dr. A. F. R. Hoernle,—13 Nos. of the Deutsche Litteratur Zeitung.

The following Gentlemen, duly proposed and seconded at the last meeting, were balloted for and elected Ordinary Members :

Sir Ashley Eden, K. C. S. I. Lieut.-Governor of Bengal (re-election.)

H. J. Reynolds, Esq., C. S.

L. King, Esq.

F. C. Channing, Esq.

E. R. Shopland, Esq.

Captain L. A. C. Cook.

Babu Hem Chunder Gossain.

W. C. Benett, Esq., C. S.

Babu Troylokyanath Mitra, B. L.

Babu Bhyrub Chunder Chatterji.

J. Bridges Lee, Esq., M. A., F. G. S., F. Z. S., F. C. S.

Babu Peary Mohun Guha, B. L.

Babu Sreenath Chunder.

The COUNCIL reported that Mr. V. Ball had been appointed Member of Council under Rules 4 and 46 (as amended during the past year), and that he would officiate as Natural History Secretary during Mr. Wood-Mason's absence from Calcutta.

The SECRETARY reported that the following coins had been acquired under the Treasure Trove Act.

1. Four gold and eight silver coins found at Nya Doomka, Santhal Pergunnahs.

2. Six silver coins from Basti.

The SECRETARY read a letter from Lieut.-Col. J. W. H. Johnstone, dated, February 15th, 1881, regarding the supposed identity of the Awans resident in the Salt Range with the Jods of Baber.

"General Cunningham in his Archæological Report on the North-West Panjab wishes to identify the Awans resident in the Salt Range as the Jods of Baber. In fact a tribe of Jods is still located in this part of the country where Baber found them. This tribe is known to be a branch of the Janjúás, and there is no difficulty on the subject of the Jods, except that we now find the possessions of the Jods and Janjúás with the Awans. I have known this for some years, and am sorry I did not before communicate it to the Society. The explanation I would give of the Awans' possession of the country is this. They were resident on both the branches of the Indus below the Salt Range. Baber found the present country of the Marwats in the Bannú district occupied by Isákhíl Níázís. Subsequently

a wave of irruption took place from the hills. The Isákhil Níázis were displaced by the present Marwatís. The former ejected the Awans from Isákhil and Miaunali and drove them into the hills compelling them in turn to expel the Jods and Janjúás. The head man of Kálábágh is still Mullah Múzaffar Khán, the Chief of the Awans."

The following papers were read—

1. *A short note on the Shrines of Sitákund in Chittagong.*—By ADHAR LÁL SEN, Deputy Collector of Jessore, lately of Chittagong.

(Abstract.)

After describing the geographical situation of Sitá Khund, the author of this paper, explains the derivation of its name "from a hot spring consecrated to Sitá, the deified heroine of the Ramáyana," and relates the various traditions regarding the disappearance of the hot spring which no longer exists in that locality. It is said to have been filled up in consequence of a dispute between the followers of Vishnu and Siva. An attempt was made by the present Mahant of the place to again open up the spring, but without success; and it is supposed that there never really was any hot spring in that locality, on account of its being "devoid of all trace of bitumen, which is invariably discovered in the adjacent hot springs." The author then proceeds to quote large extracts from various Puránas, relating the connection of Ráma and Sitá with the Sitákhund, and shows the untrustworthiness of these Puránic relations by comparing them with the accounts in Valmiki's Ramáyana according to which Ráma and Sitá can never have been in the regions where the Sitákhund is situated. Finally the author traces the pilgrim's journey as he passes from one shrine to another, giving various interesting details of each locality.

Mr. Ball remarked that though it may be true that there never was a hot spring in the locality mentioned, the absence of any trace of bitumen was no proof of its non-existence.

Extracts from this paper will be published in the Journal, Part I.

2. *A list of Earthquakes recorded in Assam during the year 1880.* Communicated by the Meteorological Reporter to the Government of Bengal.

The list will appear in the Journal, Part II.

3. *On the coins of Charibael, king of the Homerites and Sabæans.*—By MAJOR W. F. PRIDEAUX, F. R. G. S., Bombay Staff Corps.

(Abstract.)

This paper gives a description of two Himyaritic coins, which were received by the author from Aden in 1880, and attributed by him to Chari-

bael, who is mentioned in the twenty-third chapter of the *Periplus of the Erythræan Sea* as the paramount Sovereign of the contiguous tribes of the Homerites and Sabæans, and as having been on terms of friendly alliance with the Roman Emperors. This monarch was probably identical with the Himyaritic king *Kariba-él Wattâr Yehan'am*, whose name appears on three of the inscriptions discovered by M. Arnaud in the neighbourhood of Mârib in 1843, as well as on the coins exhibited to the meeting. The paper concludes with a short sketch of the Himyaritic monetary system, which may be classified into three divisions, (1) the thick imitations of the Athenian drachma, (2) the thin imitations of the late Athenian tetradrachma, and (3) the indigenous mintage with two heads, one on the obverse and one on the reverse of the coin (of which, in addition to the coins of Charibael, a few specimens were exhibited to the meeting). This last was probably the precursor of the rare Axumite series in gold, which appears to have remained current until the introduction of Islâm into South Arabia.

This paper will be published in the Journal, Part I, with a Plate.

4. *Comparative Table of the conjugations of the verbs substantive in Eastern Hindî.*—By G. A. GRIELSON, C. S.

5. *On a New Find of Early Muhammadan Coins of Bengal.*—By  
DR. A. F. R. HOERNLE.

(Abstract.)

This paper describes 14 early Muhammadan Coins of Bengal, found in November 1880 near Gauhati in Assam. They consist of 4 coins of Shams-ud-dîn Altamsh, 2 of Jalâlat-ud-dîn (Rizîyah), 1 of 'Alâ-ud-dîn Mas'aûd Shâh and 3 of Nâsir-ud-dîn Mahmûd Shâh, all Emperors of Dehli; also 1 coin of Ghiyâz-ud-dîn 'Iwaz and 3 of Mughîs-ud-dîn Yûzbak, both independent Sultâns of Bengal. Among these the coin of 'Alâ-ud-dîn Mas'aûd Shâh appears to be unique, being an exact counterpart (barring, of course, the ruler's name) of the coin of Nâsir-ud-dîn, No. 60, in Thomas' *Chronicles of the Pathân Kings of Dehli*, p. 81. It is further important as showing that the last mentioned coin should be ascribed to the younger Nâsir-ud-dîn rather than the elder. The coins of Mughîs-ud-dîn appear to be new. They are also important inasmuch as they help to determine the period of that Sultân's independence, which seems to have lasted only about three years from A. H. 652—655.

This paper will be published in the Journal, Part I, with three Plates.

Mr. Gibbs said that the paper a part of which had just been read was an interesting one; he had been for some years engaged in collecting Pathân and Moghul coins, and had procured many curious and rare speci-

ms. He hoped to be able to draw up a paper from the MS. on the new coins the Pathán kings which had been found since Mr. Thomas' book was published. He might mention two very curious ones: (1) a gold of king No 9, Isir-ud-din Mahmúd, and (2) a gold of king No. 17, Násir-ud-din Khushan. The former shows Thomas' remark on page 134 that Ghíáz-ud-din Balban was the first king that struck gold coins is incorrect. This gold coin is now in the Imperial Academy at Berlin. Mr. Gibbs having exchanged it for some other Moghul coins with the late Col. Guthrie some years ago, before he collected the Pathán series. With regard to the latter king only one silver coin is known. It is in this Society's collection, but the gold one which he obtained through a Marwari in Bombay is of much finer execution than the silver coin.

Mr. Gibbs's experience leads him to the opinion that gold and silver coins will be found of all the Pathán kings; it was the custom to coin such a distribution when the monarch was first placed on the throne, and it will be found that even now not more than 12 out of the first 30 Pathán kings are without specimens of either large gold or silver coins, often of both. Mr. Gibbs also further noticed that the series of coins of the smaller Muhammadan kingdoms set up after Muhammad bin Tughlaq were curious and worth collecting. He had had the good fortune during the famine in Bombay to get a good many specimens of the Bahmani, Malwah and Muhammadan coins, and as regard the first he had acquired the only 3 gold coins known. A paper with plates of this series will appear in a future No. of the Numismatic Chronicle for which Mr. Gibbs left instructions before he left England.

Mr. Gibbs stated that he had been engaged with Dr. Hoernle in arranging the Society's collection, and he hoped that before long a complete catalogue might be ready which will be of great service to other Museums and collectors in showing what coins were actually extant.

*Some Observations on the Standing of Animals, the Perching of Birds and the Walking Pace of Man.*—By J. C. DOUGLAS.

I.—*The Standing of Mammals and Birds.*

A Bird standing on one leg appears so strikingly unstable an object, that most observant persons feel the want of an explanation of first, why the bird chooses to stand on one leg rather than on both; and second, why this position is assumed as one of rest. It is obvious that the raised leg is rested, but it is equally obvious that the other leg has to do the work of both, and there is a decided reduction in stability, when using only one leg; but, from the bird resting in this position, there must be physiologically some economy, which renders the less stable position also less exhausting. This resting the limbs alternately is particularly frequent in natatorial birds



when standing : their legs apparently being very readily fatigued by bearing the weight of their bodies ; but although most striking in birds, it is also common to mammals. Horses particularly may be observed resting one leg at a time, and man does not as a rule stand equally on both legs, but puts his weight on each leg alternately ; even when sitting on a chair he commonly rests his legs alternately by hanging one across the other. I think this phenomenon is explained as follows :—Every muscle must have intervals of rest, and the muscles, supporting an animal which rests standing, must be rested alternately. To render this possible, the law of muscular exhaustion must in certain cases admit of the *load* on a muscle being increased, without proportionately *hastening* exhaustion. A muscle, removed from the body and stimulated to contract, suffers exhaustive loss of irritability, in direct proportion to the rapidity with which the stimuli follow each other, and exhaustion is most readily produced by stimuli following each other so rapidly, as to induce continued contraction, *i. e.*, tetanus ; but the amount of the load, if not too large, does not apparently affect the course of exhaustion, the exhaustion of two muscles bearing different loads being parallel. This being the case, it may be quite possible for an animal to even double the load on one set of muscles, without hastening their exhaustion. The muscles, bearing the additional load, not necessarily being exhausted proportionately sooner than under their own proper load, it is evident a bird resting on one leg does not exhaust it in time shorter in proportion to the increased load ; hence it is enabled to rest its whole system standing, a part at a time, just as completely as it could rest it all at once by laying down. The ease with which a bird stands on one leg is due to the relatively great surface of its base, the length of base, excluding the nails of the toes, reaching in small birds half the bird's height, that is, a man's feet would have to be two and a half to three feet long, to secure a proportional base ; the width of a bird's base in front is also relatively great.

## II.—*The Perching of Birds.*

The bird, standing on one leg, is only one instance of a very general case, and it rests itself in that attitude by reason of a physiological law governing muscular exhaustion ; but the case of a bird, sleeping on one leg on a perch, has been considered as differing from the case of a bird sleeping on one leg on the ground, and, while it is obvious the bird on the ground really maintains the upright position by balancing itself, precisely as a man does, this explanation has been considered as insufficient in the case of the perching bird. The explanation commonly accepted appears to have originated with Borelli about two hundred years ago, and is as follows :—

The flexors of the toes pass over the knee and heel in such a manner, that when the leg is bent by the weight of the body, the toes are flexed, the

sleeping bird is thus held securely on his perch by the weight of his own body ; and some authors add "without fatigue." I purposely omit other details such as the structure of the joints by which the leg is stiffened laterally and vertically.

In the first instance, if the toes were flexed by the weight of the body putting tension on the muscles, this could not happen without causing fatigue, for the mere tension of a muscle influences its nutrition and waste, hence muscular exhaustion would result. That exhaustion is felt, is proved by the bird using only one leg while resting the other, also by the fact that it changes the leg from time to time, and that on waking, the foot is opened as if cramped. The evidence in favour of Borelli's explanation is anatomical ; if the leg of a dead bird be bent under certain circumstances, the toes close together, and the foot may be so made to seize the finger of the experimentalist ; if the leg be dissected, the movements of the parts may be clearly seen to bring about the result. But although this takes place in the dead bird, and is therefore possible in the live one, it by no means follows that this is the mechanism of perching. Even this purely anatomical phenomenon, which has been relied on to prove the physiological conditions, is not invariably present, for if a bird die with its leg contracted and its claw extended, the leg may be extended and flexed without closing the toes ; in fact, the production of the phenomenon depends on the condition of the muscles after death. If the bird dies with its claws open and leg extended, the flexor muscles of the toes are not opposed by the extensors, they shrink and lose their elasticity when they die, and the phenomenon is produced ; if they are opposed by the extensors, and the leg is bent, they lose their elasticity but cannot contract, and are therefore, when dead, elongated, and the phenomenon is not produced. It is very obvious in the live bird these muscles are elastic, and their exact length while living may be anything between the above extremes, but whether they act in the manner stated, depends entirely on their condition in the living bird, which is standing with his legs bent at their normal angle, these muscles being opposed by another set of muscles, and both being under the control of the bird's will. Because bending the leg bends the toes in a dead bird, in which the muscles have lost their elasticity and become shortened, to assume that therefore in the live bird, the mechanism acts precisely in the same manner, is an assumption in my opinion which is contradicted by observation of the living bird, and by the consideration of the general laws of which the perching bird is but a particular instance. Mammals and birds, on plane surfaces, maintain the upright attitude by balancing themselves, and birds standing on two legs on a perch do not, unless the perch be shaken, hold the perch, they simply balance themselves ; the birds are prevented from slipping by the soft under-surface of the foot, which gives a foot-hold little liable to slip on the rough bark of a tree, and if the perch

be moved, slipping is still further guarded against, by turning in the nails so that their points touch the perch. If the perch be violently swung, the bird bends his legs, and rests with his breast on the perch, thereby lowering his centre of gravity. If a live bird be perched on the finger, it will be felt that it balances itself and does not grip, but it frequently uses the points of its claws, particularly of the hind ones. If the hand be moved forwards, the bird having a tendency to fall backward, it will be found to actually raise its front toes, and stick in the points of the hind claws; far from gripping tighter, it actually grips less tightly. If a sleeping bird be shaken, it awakes and puts down its second foot. If the perch be swung while the bird is asleep, the bird will be observed to move its body *in advance* of the movements of the perch. Although the sleeping bird usually uses the point of his hind nail, he does not always do so, and sometimes sleeps, obviously *not* holding the perch, but evidently balancing, the perch being stationary, but if the perch be moved slightly, the hind nail is used immediately. I cannot detect any bending of the leg, when the bird goes to sleep, beyond that which exists when it is awake, nor is the flexure of the last joint of the toes accompanied by a bending of the leg under ordinary circumstances. On the other hand there can be no doubt, that, in the live bird, flexure of the toes is independent of bending of the leg; a live bird can open or close its claws, with the leg straightened, or bent close to the body, and if a bird be under the influence of either, the flexure of leg and foot, simultaneously observed in the dead bird, is not observed. Birds commonly rest with the breast on the perch, in these cases, the claws will be found quite open; it is obvious in this case, that flexure of knee and heel does not cause flexure of the toes.

If bending of the leg necessarily caused flexure of the toes, the bird would in some cases evidently be inconvenienced, during incubation for instance. The idea, that the weight of the body tending to bend the leg might so flex the toes as to diminish the fatigue of perching, is obviously erroneous mechanically; for, if the grip of the perch were produced by the contraction of particular muscles, and if the same muscles were employed on the additional labour of preventing flexure of the leg, the two duties would not be so opposed as to make the strain on the muscles less than it would be if they performed but one duty, and the additional duty would increase the load not decrease it. It appears to me, that perching birds really balance themselves, just as mammals and birds on plane surfaces do; that they are enabled to do this just as man is, by means of opposing muscles; that flexure of leg and toes are independently under control of the bird's will as in man; and that the movements found dependent on each other in the dead bird after alteration of the muscles, are independent in the live bird; and that the large surface covered by the toes, the relative lightness

of the body, and the soft under-surface and sharp nails of the toes preventing slipping are sufficient to explain how a bird is enabled to sleep perched, just as a horse or a bird sleeps standing on a plane.

### III.—*The Walking Pace in Man.*

Previous observers have assumed that the path traversed by man in walking is a straight one, that each step is alike, and that in natural walking, the complementary motions are evoked regularly and symmetrically. I have made a great number of observations, and have surveyed and plotted out natural paths across an extended plain, and I find the natural path is a wavy line. If the pace be slow, the deviation from the straight line is greater than if the pace be quick, and this deviation is greatest when the walk is very slow. The sinuous walk of a man slightly intoxicated, is an exaggeration of the normal walk; the difficulty of walking slowly beside a second person without occasionally coming against him, unless touch be kept in some way, is a matter of common observation. It appears that the adoption of sinuous paths in laying out gardens, with a view to imitate nature, is an unconscious imitation (often exaggerated) of the foot paths formed naturally, whenever an extended plain has to be crossed by persons on foot, and this sinuosity is a consequence of the natural walk of man being in a sinuous path, probably by reason of the equilibrium being imperfect, and the movements not strictly symmetrical.

### 7. *List of Diurnal Lepidoptera inhabiting the Nicobar Islands.*—By J. WOOD-MASON, Deputy Superintendent, Indian Museum, and L. DE NICEVILLE.

(Abstract.)

In this paper which will appear in the Journal, Part II, the authors state, that in Mr. F. Moore's paper on the Lepidopterous Fauna of the Andaman and Nicobar Islands, only 23 species of rhopalocerous Lepidoptera are recorded from the Nicobar group.

The Museum has recently received from Mr. F. A. De Rœpstorff a collection of Nicobar butterflies consisting of thirty-four species, twenty-five of which are recorded, in the present paper, for the first time, and two are described as varieties of known forms.

This paper will appear in the Journal, Part II.

## LIBRARY.

The following additions have been made to the Library since the meeting held in February last.

## TRANSACTIONS, PROCEEDINGS AND JOURNALS.

*presented by the respective Societies and Editors.*

Berlin. K. preussische Akademie der Wissenschaften,—*Monatsbericht*, September and October 1880.

Bordeaux. Société de Géographie Commerciale,—*Bulletin*, No. 2.

Calcutta. Geological Survey of India,—*Memoirs*, Palæontologia Indica, Series XII, Vol. III, Part 1.

*Feistmantel, Dr. O.*—The Flora of the Talchir Karharbari Beds.

Lisbon. Sociedad de Geographia,—*Boletin*, Second Series, No. 2.

London. Royal Microscopical Society,—*Journal*, Vol. III, Nos. 6 and 6a, December 1880.

———. Royal Astronomical Society, *Monthly Notices*, Vol. XLI, No. 1.

———. Institution of Mechanical Engineers,—*Proceedings*, No. 3, 1880.

———. The Academy,—Nos. 443, 454 to 456.

———. The Athenæum,—Nos. 2777 to 2780.

———. Nature,—Vol. XXII, No. 574, and Vol. XXIII, Nos. 585—588.

München. K. b. Akademie der Wissenschaften,—*Sitzungsberichte der mathematisch-physikalischen Classe*, Parts 2—4, 1880.

———. ———. ———. philosophisch-philologischen und historischen Classe,—Vol. II, Part 3, 1879; and Parts 1—3, 1880.

———. ———. Abhandlungen,—historische Classe, Vol. XV, Part 2.

———. ———. ———. philosophisch-philologischen Classe,—Vol. XV, Part 2.

———. ———. ———. mathematisch-physikalischen Classe,—Vol. XIII, Part 3.

New York. American Oriental Society,—*Proceedings*, October 1880.

Paris. La Société d'Anthropologie,—*Bulletin*, Vol. III, Part 3, April to July 1880.

———. La Société de Géographie,—*Bulletin*, Vol. XX, November 1880.

Pisa. Società Toscana di Scienze Naturali,—*Atti, Processi Verbali*, 14th November 1880.

Rome. Società degli Spettroscopisti Italiani,—*Memorie*, Dispensa 9, September 1880.

Roorkee. Professional Papers on Indian Engineering,—Vol. X, No. 39, February 1881.

- Vienna. Kaiserliche Akademie der Wissenschaften,—*Fontes Rerum Austriacarum*, Vol. XLII, Part 2.
- . Archiv für Österreichische Geschichte,—Vol. LIX, Parts 1—2, and Vol. LX, Part 1.
- . Sitzungsberichte,—mathematisch-naturwissenschaftliche Classe, Part I, Vol. LXXIX, Nos. 1—5; Vol. LXXX, Nos. 1—5: Part II, Vol. LXXIX, Nos. 4—5; Vol. LXXX, Nos. 1—5; Vol. LXXXI, Nos. 1—3: Part III, Vol. LXXX, Nos. 1—5; Vol. LXXXI, Nos. 1—3.
- . philosophisch-historische Classe,—Vol. XCIV, Nos. 1—2; Vol. XCV, Nos. 1—4, and Vol. XCVI, No. 1.
- . philosophisch-historische Classe, Denkschriften, Vol. XXX.
- . mathematisch-naturwissenschaftliche Classe,—Denkschriften, Vol. XLI.
- Yokohama. Deutsche Gesellschaft für Natur-und Völkerkunde Ostasiens,—*Mittheilungen*, December 1880.
- . Asiatic Society of Japan,—*Transactions*, Vol. VIII, Part 4.
- Zagreb. Arkeologickoga Druztva,—*Viestnik*, Vol. III, No. 1.

### PAMPHLETS,

*presented by the Authors.*

- LYALL, C. J. *Sketch of the Hindustani Language*. Sm. 8vo., Edinburgh, 1880.
- SCHWENDLER, L. *Report on the Electric Light at the East Indian Railway Company's Station, Howrah (Calcutta)*. Fcp., Calcutta, 1881.

### MISCELLANEOUS PRESENTATIONS.

- CARRINGTON, R. C. *List of Light-Houses and Light-Vessels in British India, including the Red Sea and Coast of Arabia (Suez to Singapore)*. Obl 4to., Calcutta, 1881.

#### MARINE SURVEY DEPARTMENT.

- DÖLLINGER, J. v. *Das Haus Wittelsbach und seine Bedeutung in der deutschen Geschichte*. 4to., Munich, 1880.
- ROCKINGER, DR. L. *Die Pflege der Geschichte durch die Wittelsbacher*. 4to., Munich.
- ZITTEL, DR. K. A. *Ueber den geologischen Bau der libyschen Wüste*. 4to., Munich.

#### K. b. AKAD. DER WISSENS., MÜNCHEN.

- WRIGHT, W. *The Palæographical Society. Facsimiles of Ancient MSS. Oriental Series. Part V*. Fol., London, 1880.

#### PALEOGRAPHICAL SOCIETY.

Report on the Administration of the Land Revenue Department of the Central Provinces for the Revenue year 1879-80. Fep., Nagpur, 1881.

CE. COM. CENTRAL PROVINCES.

Account of the Operations of the Great Trigonometrical Survey of India, Vol. VI. 4to. India Prin. 1880.

Synopsis of the Results of the Operations of the Great Trigonometrical Survey of India. Vol. VII. 4to. India Prin. 1879.

SURVEYOR GENERAL OF INDIA.

Sixteenth Annual Report of the Sanitary Commissioner with the Government of India 1879. Fep., Calcutta 1881.

SANITARY COMMISSIONER WITH THE GOVERNMENT OF INDIA.

Indian Forester. Vol. VI, No. 3, January 1881.

BENGAL GOVERNMENT.

PALMER, E. H. (Sacred Books of the East. Vols. VI and IX). The Qirân. 2 Vols. 8vo. Oxford. 1880.

FALLOS, DR. S. W. New English-Hindustani Dictionary, Part I.

HOME, REVENUE AND AGRICULTURAL DEPARTMENT.

### PERIODICALS PURCHASED.

Göttingen. Gelehrte Anzeigen,—Nos. 3—4. and Index for 1880.

———. Nachrichten,—Nos. 20—21, and Index 1880; No. 1, 1881.

Leipzig. Annalen der Physik und Chemie,—Vol. XII, Part 1.

———. ———. Beiblätter,—Vol. V, No. 1.

London. Society of Arts,—Journal, Vol. XXIX, Nos. 1469—1471.

———. Chemical News,—Vol. XLIII, Nos. 1103—6, and Index to Vol. XLII.

———. Publishers' Circular,—Vol. XLIV, Nos. 1040—1.

Paris. Comptes Rendus,—Vol. XCII, Nos. 1—4.

———. Revue Scientifique,—Vol. XXVII, Nos. 2—5.

———. Revue Critique,—Vol. XI, Nos. 2, 4—5.

———. Revue des deux Mondes,—Vol. XLIII, Nos. 2 and 3.

———. Journal des Savants,—January 1881.

———. Annales de Chimie et de Physique,—Vol. XXI, December 1880.

Philadelphia. Manual of Conchology, Part 8.

### BOOKS PURCHASED.

GOULD, J. The Birds of Asia. Part XXXII. Fol., London, 1880.

GOULD, J. The Birds of New Guinea and the Adjacent Papuan Islands. Part XI. Fol., London, 1880.

SALLET, A. VON. Die Nachfolger Alexanders des Grossen in Baktrien und Indien. 8vo., Berlin, 1879.

PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
FOR APRIL, 1881.

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The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 6th April, 1881, at 9·15 P. M.

H. B. MEDLICOTT, Esq., F. R. S., President, in the Chair.

In accordance with the announcement made at the Annual Meeting held in February last, the President ordered the balloting lists for the Election of the Council and Officers for 1881 to be distributed, and appointed Col. J. Sconce and Major H. S. Jarrett Scrutineers.

The PRESIDENT announced that the Scrutineers declared the result of the ballot to be as follows :

*President.*

The Hon'ble Sir Ashley Eden, K. C. S. I., C. I. E.

*Vice-Presidents.*

Dr. Rájendralála Mitra, C. I. E.

C. H. Tawney, Esq., M. A.

The Hon'ble H. J. Reynolds, B. A., C. S.

*Secretaries and Treasurer.*

J. Wood-Mason, Esq.

Dr. A. F. R. Hoernle.

A. Pedler, Esq., F. C. S.

V. Ball, Esq., M. A., F. G. S.

*Other Members of Council.*

H. B. Medlicott, Esq., F. R. S.

J. Westland, Esq., C. S.

J. Eliot, Esq., M. A.

D. Waldie, Esq., F. C. S.

H. Beverley, Esq., C. S.

Babu P. C. Ghosha.

L. Schwendler, Esq.



Mr. Westland said that he trusted he would be allowed as one of the retiring Vice-Presidents of the Society to propose a vote of thanks to Mr. Medlicott, the out-going President. Mr. Medlicott had unusual qualifications for the post both as a man of science, and as a man of business; other gentlemen could testify to Mr. Medlicott's services rendered to the Society in the former capacity, he himself could say from his own experience, how completely and efficiently Mr. Medlicott managed the business of the Society. The Society was under great obligations to Mr. Medlicott, for the labour he had so successfully and so willingly bestowed on the management of its affairs.

In resigning the President's chair, Mr. Medlicott spoke as follows :

It is very gratifying to me to return thanks for the response this meeting has accorded to the kindly words spoken by Mr. Westland. I shall not cease to endeavour to be of service to the Society.

The brief remarks I wish to make on retiring from the office of President would have been more appropriate had this event taken place at the annual meeting, as is customary. As to the few observations I did make on that occasion, in referring to the report for the preceding year, I was surprised to find that they have been printed in our Proceedings for February as "the President's address." It looks like a stroke of irony on the part of our Secretary; but I acquit him of the charge. I by no means meant to make a mockery of the imposing undertaking known as a Presidential Address. On the contrary, I had come prepared to take my leave of office with a humble apology for what many may look upon as my spontaneous collapse. At the same time I wished to justify the step I had taken in resisting what is an innovation, and as I believe a mistaken one, in the practice of our Society. At the previous annual meeting I gave a notice of motion to that effect; and I think the matter of sufficient importance to recur to it now.

The tendency I would deprecate—that of following the practice of learned bodies elsewhere—is superficially laudable; but I may designate it as unpractical and therefore unscientific. The essence of practical reason is, the intelligent apprehension of conditions, and adaptation thereto; in view, no doubt, of a best conceivable standard, but the premature adoption of that standard may be a fatal form of blunder. I do not allow that my action arises from a defective estimate of what a scientific Society should be: it is rather that the standard I look to is incompatible with ourselves and our circumstances. Let us at all events avoid shams and false pretension. We are by profession a scientific body; but our body has been and is to a large extent non-scientific, or even anti-scientific; and symptoms were not wanting that a marked prominence of the scientific element in the administration would lead to atrophy of the body. Few

will deny that, constituted as we are, our President should often be a man known to the general public. A complete obstacle to this would be, and has been, the innovation of an annual presidential discourse upon science in some form, which performance is by no means worth the sacrifice. The real credit of the Society and of its working members depends on the amount of information to be found in its publications. I would, therefore, ask those members to be content with this solid advantage afforded by the Society, and to forego an ambition of flags and fireworks.

I must not, however, allow it to be said, that I am making a virtue of necessity—shielding my incapacity under the guise of renunciation. Of actual incapacity I cannot speak: but I do confess myself unable, without a great deal more leisure than I can command, to prepare what I should care to offer as an address to a learned Society. This touches, perhaps, the most vital objection to the practice I wish to see held in abeyance for special occasions. You can seldom find a suitable president of any denomination who is not already an overworked official; and very few men thus placed so overflow with knowledge as to undertake so serious a task without inadmissible interference with regular duties. Some of you are aware how difficult it has been of late to find a president. More than one member thoroughly competent to lead and to address the Society have declined the post; and though I cannot speak with certainty, I strongly suspect that the obnoxious innovation had much to say to our disappointment. They have escaped by passive resistance; it has fallen upon me to incur the obloquy of overt rebellion, for which I must crave your indulgence.

I have now the satisfaction of handing over office to a President under whom the Society should flourish in all its branches.

Mr. C. H. TAWNEY, M. A., Vice-President, then took the Chair.

The minutes of the last general Meeting were read and confirmed.

The following presentations were laid upon the table—

1. From the Californian Academy,—Early Discoveries of the Hawaiian Islands in the North Pacific Ocean, by H. A. Peirce.

2. From the Registrar, Calcutta University,—Tagore Law Lectures, 1879,—The Law relating to the Hindu Widow, by Troilokyanath Mitra.

3. From the Bengal Government,—The Wild Silks of India, principally *Tusser*, by T. Wardle.

4. From the Madras Government,—(1) A Classified Index to the Sanskrit MSS. in the Palace at Tanjore, by A. C. Burnell, (2) Photographs of Humpi in the Bellary District, of Amravati, of Undapalli and of Kondapalli in the Kistna District.

5. From the Geographical Society of Lyons,—Rapport Annuel, Séance Solennelle, 23rd December 1880.

6. From the authors,—Table showing the conjugation of the Verb substantive in Eastern Hindi, by G. A. Grierson. A Detailed Analysis of Abdul Ghafur's Dictionary of the Terms used by Criminal Tribes in the Panjáb, and a sketch of the Changars and of their Dialect, by Dr. G. W. Leitner. Bi-Metallism at 15½ a necessity for the Continent, for the United States, for England, by H. Cernuschi.

7. From the Home, Revenue and Agricultural Department,—A Comparative Grammar of the Gaudian Languages with special reference to Eastern Hindi, by Dr. A. F. R. Hoernle.

8. From Dr. A. F. R. Hoernle,—Nos. 5 and 6 of 1880 of the *Deutsche Litteratur Zeitung*, and On the Khorsabad Inscriptions, by Edward Hincks.

9. From the St. Xavier's College Observatory,—Observations taken from July to December 1880.

10. From the Political Agent, Bundelkhand,—14 Copper Coins.

The following Gentlemen are candidates for ballot at the next meeting.—

1. J. Cockburn, Esq., proposed by H. Rivett-Carnac, Esq., seconded by Dr. J. Anderson.

2. Capt. E. Molloy, 5th Ghurkas, Abbotabad, proposed by G. Hughes, Esq., C. S., seconded by H. W. McCann, Esq., M. A., D. Sc.

The SECRETARY reported that the Hon'ble B. W. Colvin and the Bishop of Rangoon had intimated their desire to withdraw from the Society; and that the elections of Mr. J. A. Brown and the Rev. J. S. Doxey had been cancelled under Rule 9.

The COUNCIL reported that Mr. J. C. Douglas had left India, and that Mr. V. Ball had been asked to officiate as Treasurer in his place.

The SECRETARY reported that the following coins had been acquired under the Treasure Trove Act:—

From Deputy Commissioner of Kheri, 4 silver and 4 copper coins.

From Deputy Commissioner of Chhindwara, 6 copper coins.

The SECRETARY announced that the following works had been sanctioned for publication in the *Bibliotheca Indica Series*, on the recommendation of the Philological Committee:

1. The *Parāṣara Mādhava Smṛiti*, to be edited by Paṇḍit Chandra Kānta Tarkālakāra, who has just completed an able edition of another law book, the *Gobhilīya Sūtra*. Several MSS. are available and the work will be edited with Mādhava's commentary.

PLATE I.

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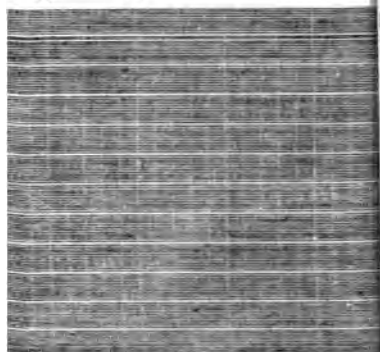
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2. An English Translation of the *Suśruta*, to be prepared by Dr. U. C. Datta. This is an ancient Hindu medical work, hardly less important than the Charaka. A portion of it has been already translated by another Babu, under the supervision of Dr. Charles, who has placed his MS. at the service of the Society.

3. The *Naqaid el Fezazdaq and Jerir*, to be edited by Mr. C. J. Lyall in conjunction with Dr. Wright of Cambridge. This work is extremely interesting both from the philological and historical point of view, as it abounds in references to the old pagan history of the Arabs, and the commentary with which the text is provided elucidates many obscure points of that subject.

Mr. H. F. BLANFORD, F. R. S. exhibited photographs of the Van Rysselberghe Meteorograph, and specimens of the engraved plates produced by it, with proof impressions from them; and gave a general description of the instrument and its working. A specimen of the record obtained will be found in plate I.

After referring to the fact that eye readings of instruments, if taken only 3 or 4 times in the day were insufficient to meet the demands of modern Meteorological enquiry, and if taken hourly and carried on night and day, demanded such an establishment of observers as to practically restrict detailed observation to a few costly observatories, he observed that, for nearly half a century, inventive ingenuity had been directed to the construction of self-registering or autographic instruments. Among the earlier inventions of the kind were Whewell's and Osler's anemographs, King's barograph, &c., and among the more elaborate of later inventions, the Kew thermographs and barographs which register by photography, Theorell's barograph which prints in figures the value of the barometer reading at short intervals, and Beckley's anemograph.

These instruments were designed to register either one element of observation only, or at the utmost two, as in the case of the thermograph and the anemograph. But some inventors had gone beyond this, and had aimed at registering all the more important elements of meteorological observation by means of one and the same recording apparatus. Such instruments are termed meteorographs, and in order to establish communication between the several instruments and the recording apparatus, the former fixed in various parts of the building according to the character of the required exposure, the latter in a secure place in the interior of the building, the aid of electricity had to be called in. A very elaborate instrument of this kind had been in operation for many years at Berne; another, less elaborate, invented by the late Father Secchi, at Rome; and also at Zi-ka-wei near Shanghae and at St. Xavier's College at Calcutta. But the latest and most compact, and at the same time the least costly and

most effective of all, is the very beautiful instrument, originally designed by M. Van Rysselberghe and constructed with many original improvements by the very ingenious mechanician M. Schubert of Ghent.

Two of these instruments have lately been received for use at Allahabad and Lahore; and while awaiting the provision of the requisite accommodation, at the places of their destination, one of them has been set up and is now in operation at the Meteorological office, No. 4 Middleton Row, Calcutta, and is open to the inspection of such members of the Society as may desire to examine it.

The details of the mechanism could hardly be understood without watching the instrument at work, and even then not without some careful study and examination. All that could be attempted would be to give some general idea of its principles.

The instrument registers, at successive intervals of ten minutes, the readings of (1), the dry and wet bulb thermometers; (2), the rain gauge; (3), the direction of the wind; (4), the height of the barometer and (5), the rate of the wind movement in the previous interval. All these are engraved in succession on a thin metallic plate fixed on a revolving cylinder, and, at the same time, the scale of all the instruments is engraved, so that the values may be at once read off; and when the plate is removed from the cylinder and the trace bitten in with etching liquor, it may be printed from in an ordinary copper-plate press, and any required number of copies obtained for distribution.

The principal motive power by which the recording cylinder is made to revolve, and the electric connections with the several instruments made and interrupted in succession, is given by clockwork.

This is set in action, on the completion of each ten minutes interval, by an ordinary clock, the minute-hand of which makes contact with a spring projecting from the brass rim which surrounds the clock face, and completes an electric circuit; the current of which, acting on an electro-magnet releases a detent, allowing the cylinder to revolve, and at the same time causing a shaft to set in action a somewhat complex system of commutators.

Two batteries are employed, each consisting of eight Daniell's elements. One of these serves to work the burin which engraves the trace, by acting on an electro-magnet which pulls back the burin from the cylinder, against which it otherwise presses by means of a spring; the other, the regulating current, is directed through the several instruments in succession by means of the commutators, and then, acting on a series of electro-magnets makes and breaks the engraving current at the proper intervals according to the values indicated by the several instruments. The graduation is effected by passing one or the other current through a brass ring which revolves with the

cylinder and bears a number of deep grooves on its surface corresponding to the graduation of the instruments. A spring which presses on the grooved surface and conveys the current, suffers an interruption of contact when passing over the grooves, and thus produces a minute break in the engraved line, and, when the burin is not engraving, allows it to mark a series of dots corresponding to the graduation.

At the commencement of each revolution and before the registration begins, an endless screw which carries the burin is made to revolve through a sufficient distance to bring the burin about  $\frac{1}{10}$  of an inch lower on the plate; and at the end of every two hours through a somewhat greater distance, leaving a broader interval between the engraved lines and furnishing a time-scale.

The first instrument which gives its trace is the dry bulb thermometer. The thermometers are open at top, and the tubes give admission to two probes of platinum wire, which, by means of the mechanism before noticed are made to descend slowly until they form contact with the mercurial columns. As the dry bulb thermometer always (except in an absolutely saturated atmosphere) stands at a higher temperature than the wet bulb, its contact is first made, completing the regulating circuit. This acts on an electro-magnet, which, by attracting an armature, completes the burin current and draws the burin back from the cylinder; and, at the same time, causes a catch to start forward and arrest the further descent of the platinum probe. That of the wet bulb continues to descend, until, on making contact with the mercury, the regulating current acts on another electro-magnet, which interrupts the burin current, releasing the burin, which again presses on and engraves the plate till the regulating current is cut off by the action of the commutator.

Next comes the trace of the rain gauge. The rain gauge is now situated on the roof of the office and communicates with the registering apparatus by two wires, which form a part of the circuit of the regulating current. The regulating current (or a branch of it) can always pass through this circuit, when contact is made in the rain gauge. When rain is falling it passes from the collecting funnel into a tip bucket, and this when full tips and empties itself, at the same time making a metallic contact which allows a momentary current to pass. This current acts on an electro-magnet in the registering apparatus below, the armature of which acting on a ratchet wheel makes a small brass cylinder revolve through a single tooth. One half of this cylinder is of greater diameter than the other, the two surfaces being separated by a helical margin, such as might be produced by applying a wedge-shaped strip of brass plate to the surface of a cylinder, with the two rectangular edges of the wedge respectively parallel to the axis and base of the cylinder, while the hypotenuse forms the helical margin.



A spring, which the mechanism, set in motion by the clockwork, causes to ascend and descend in a direction parallel with the axis of the cylinder, comes in contact with the projecting portion, the breadth of which is the greater the more rain has entered the gauge. During this contact, the regulating current passes, cutting off the circuit of the engraving current, and setting free the graver, which records a line on the plate corresponding to the length of the cylindrical surface in contact with the spring.

Next come the wind directions given by the anemometer. In general construction, the anemometer resembles that of Beckley. The direction of the wind is given by two windmill regulators, which cause to revolve a plate forming the cover of a flat cylindrical box. The plate is metallic and presses on eight insulated springs, set at the eight principal divisions of the compass, and connected with eight wires which lead to the recording apparatus below. There is also a ninth wire always in metallic connection with the revolving plate, and the regulating current passes into the upper plate and down by 6 or 7 of the direction springs and their wires whenever the anemometer wires are brought into circuit by the action of the clockwork. It is never completed through the whole 8 springs. In the upper plate, opposite to the pointer which indicates the wind direction, is let in an insulating piece of glass, and this is always in contact with one and sometimes with two adjacent springs, through which therefore, the communication is cut off.

The eight direction wires communicate with eight small studs; over which the clockwork mechanism causes a small spring to pass, making contact successively. The regulating current, passing through these and acting in the manner already described, allows the graver to make a short mark corresponding to each of them, with the exception of that one (or two) thrown out of circuit by the plate of the anemometer.

Next comes the barometer, and in the case of this instrument, M. Von Rysselberghe has adopted a very beautiful contrivance which dispenses with the usual corrections for temperature, and enables the barometer to give at once its reduced or corrected value. The principle is discussed by M. Van Rysselberghe in his original paper in the volume of the *Bulletins de l'Académie Royale de Bruxelles* for 1873; and I need only describe it in general terms, by saying that in a syphon barometer such as is used in the meteorograph, the quantity of mercury in the instrument may be so adjusted to the diameter of the tube, that the level of the mercury in the shorter or open arm of the tube is unaffected by changes of temperature. In the open arm of the tube, therefore, the changes of level take place under changes of pressure only. The reading of the barometer is communicated by an arrangement similar to that already described in the case of the thermometers; *viz.*, by a steel cylindrical probe which

descends until it makes contact with the mercury, closing the regulating current which, in this case acting on an electro-magnet, completes the burin circuit, and causes the withdrawal of the graver.

Lastly the counter of the revolutions of the anemometer cups is recorded. The cups of the anemometer complete the circuit of a branch of the regulating current, once in each revolution ; and this current, acting on a ratchet connected with the mechanism below, causes a graduated metallic rod to be pushed up through staples in which it works stiffly, as long as the recording mechanism is not in action. But coincidently with the last part of the revolution of the recording cylinder, a catch, in descending, makes contact with a projection on the graduated metallic rod, brings the latter back into its initial or zero position, and during the time of contact completes the regulating current, which cuts off the engraving current, and allows the burin to engrave a line of length proportionate to the displacement of the rod.

Dr. A. F. R. HOERNLE exhibited some copper coins and some antiquities found in the ruined town of Khokhrakote lying a short distance to the north of the present town of Rohtak and read the following account of their discovery written by Durga Pershad, Tehsildar of Rohtak.

"Although nothing has to the present day been discovered either from inscriptions, engraving or plates, which in ancient times used to be put into foundations of buildings, to shew the year in which the towns of Rohtak, Khokhrakote, Lalpur and Brahma were built, tradition gives the following brief account.

"This ruined town of Khokhrakote is situated to the north of Rohtak and thousands of years have passed since it was ruined.

"It is said that the town of Rohtak was founded a few thousand years ago by Raju Rohtas, son of Raju Prichand, that it has derived its name from him, and that on the side of Khokhrakote was built an extensive fort with a small population. This population on the foundation of Rohtak gradually disappeared, and the materials of the fort were removed for the construction of another to the east of the town of Rohtak which is now inhabited by 'Sheikhs.'

"It is also said that this ruined town of Khokhrakote, besides the fort alluded to above, consisted of houses of the employes of the State, a market with a few shops of workmen forming a cantonment, and palaces of petty Nawabs and persons of substance, but that from the time of Raju Rohtas it has ceased to be inhabited.

"Another tradition says that it was ruined some time before the foundation of the town of Rohtak.

"These two traditions, therefore, almost entirely correspond with one

another, as, if at the time Rohtak was inhabited, there was a fort at Khokhrakote, it is very probable that it must have been dismantled and the materials removed to Rohtak.

"To the west of Rohtak lies the town of Lálpur, which is said to have been founded by Lálchand Seth a millionaire, and was mostly occupied by money-dealers (Mahájans) and Bráhmaus, with a small number of Khatris.

"In Sambat 1772 this town had succumbed to an overflowing of a branch river named "Chomang", owing to the inundation of the Jamna river. The marks as to the existence of the former are still visible in the neighbourhood of maúzás Sāngi and Kheri Ballab, by the presence of a few bridges and the uneven ground on which it flowed. The present Gobáná canal which runs towards this ruined town of Lálpur, into the Rohtak Parganá, has also been constructed on the bed of the said river.

"Large bricks are dug out from the ruined buildings of this town and used in building others at Rohtak.

"With a view to discover objects of antiquity, the Commissioner of the Division and Mr. Wood, Deputy Commissioner, in September or October 1879, inspected these ruined towns and proposed to dig the mound, close to the remains of the old fort, called "Nawabi tilá" by the residents of Rohtak, by reason of its being supposed to be the site on which the palaces of the Nawábs were formerly situated, and also on account of its being the highest of all the mounds in this ruinous tract.

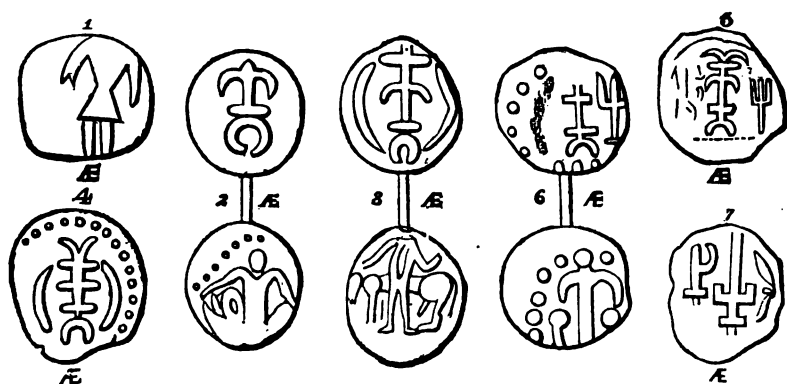
"In November 1879, the District Committee sanctioned an expenditure for the digging of this mound. It was first dug to a depth of 8 or 10 feet below the surface, when a large quantity of earth, which seemed as if it had been thrown in, was dug out, and then ruined walls were disclosed and a quantity of interesting relics, such as pieces of earthen vessels, bones, and rusty iron, as also a few shells. At about 15 feet lower down, the foundations of the walls were at an end, and again earth as above noted was dug out. The diggings continued for 7 or 8 feet, when a second set of ruined walls was discovered and a small room which contained some decayed jawár grain which on being touched at once became dust. This, and an image which, from being disfigured by decay, could not be made out, but presumably of a deity, the face being very much like the representation of Buddhá, were found amongst debris and earth. The foundations of the second set of walls having ended at a depth of about 6 or 7 feet, the remains of a third set of walls appeared at about a depth of 38 feet, and when dug to about 6 feet, a small earthen pot, with the mouth covered over with mud, containing some small coins, was found. On the evening of 3rd January 1881, these coins with other relics, shells &c., that were discovered from the mound in question at Khokhrakote, were produced before His Honor the Lieutenant-Governor when encamped at Rohtak. His Honor

after inspection was pleased to order a few of the coins to be sent to him, together with an account as to their discovery.

"The excavations were carried on to a depth of 60 feet, and the expenditure incurred was Rs. 459."

Dr. Hoernle observed that there was some uncertainty as to the real depth to which the excavations were carried. At the end of the account, it was stated that the depth was 60 feet, but the amount of the depths of the several diggings previously detailed in the account was much larger, about 80 feet.

With regard to the coins, he remarked that they appear to be late Indo-Scythic. In Prinsep's *Indian Antiquities*, p. 417 (Plate XXXIV, Nos. 11, 12, 13) they are classed as Indo-Sassanian; but wrongly. They have no trace of the characteristic Sassanian fire-altar, nor of the head of the king in profile. On plate VIII, No. 8 and Plate IV, No. 10 (*ibidem*), they are classed as Indo-Scythic, which they undoubtedly are, or rather probably late imitations of them. This is shown by the characteristic "Šiva and bull" on the reverse, so well known from the coins of Kadphises and Vasudeva (see *Ariana Antiqua*, Plates X, No. 12, XIV, No. 14). The deterioration from the original type can be distinctly traced, in the present series of coins, on the obverse (see facsimile woodcuts). The coins of Kadphises and Vasudeva have, on the obverse, the full figure of the king with a trident in front.



The full figure is still clear on No. 1 (compare No. 10 on Plate IV of Prinsep's *Indian Antiquities*, Vol. I); on No. 2 it has shrunk into mere crude outlines; in Nos 3 and 4 the outlines are still more attenuated; in Nos. 5 and 6 the trident may be seen in front of the skeleton figure, on

the right ; in No. 7 the same on the left. The reverse of No. 1 resembles that of No. 2. The reverses of Nos. 4, 5, 7 resemble that of No. 3. In No. 6 the same deteriorating process may be observed on the reverse ; the man and bull having been attenuated to mere outlines. It may be noted that on Vasudeva's coins, there is a trident in front of the king on the left, and another in his hand on the right ; and further, that the final skeleton (as in Nos. 4 and 5) closely resembles the old Nāgarī characters णो (*i. e.*, ण + न + ॐ in conjunction), which are very much like the characters that are seen under the arm of the king (in full figure) in the earliest Gupta coins (*e. g.*, of Ghaṭotkacha). This fact would seem to link the present coins on to the Gupta coins.

The antiquities consisted of 16 pieces ; *viz.*, 3 images, 2 pieces of rusty iron, 2 pebbles, 3 globular stones, 3 shells (*cowries*), 4 pieces of "ivory" ornaments. One of the images is a rude, hollow iron figure, broken in 3 pieces representing a squatting man with a top-knot and long pendent ears, another is a very rude full-sized male figure, bow-legged and with arms a-kinbo, unclothed ; apparently a votive figure or a mere child's toy. The third is the full male figure of a divinity, cut in low relief on a small flat piece (apparently) of the well-known Agra soap-stone, with head-dress, necklace and sacred thread, both arms turned upwards and each supporting some conical object. Of the two pebbles one is the exact half of a well-turned globe ; the other is in its natural form. The three globular stones are really spindle-whorls made of clay, of the volcano-shaped kind, described and figured by Mr. Rivett-Carnac in the *Journal Asiatic Society, Bengal*, Vol. XLIX, page 127. The four so-called "ivory" pieces are the broken parts of two armlets. They are not of ivory, however, as described by the finders, but of conch-shell, as pointed out by the Natural History Secretary.

Mr. BALL, Officiating Natural History Secretary, exhibited samples of the sticks used in the hilly districts of Bengal, for producing fire and in connection with them made the following remarks :

Some years ago I exhibited a sample of the fire sticks used by the inhabitants of the Nicobar islands ; these were cut from some soft white wood, possibly from a species of *Bombax*. Subsequently in Sambalpur I found that the inhabitants of the jungles there knew how to make fire in exactly the same way, the sticks used being either of the small solid bamboo or the branches of the *pothur* tree (*Croton oblongifolium*). In this case my attention was drawn to the fact by finding sticks which had been so used cast away in the jungles. On asking the coolies with me whether they understood the art, they immediately set to work in the following manner.

Breaking off two pieces of dry bamboo which had about twice the diameter of an ordinary lead pencil, they pointed one of them at one end, and on the side of the other they made a small pit to receive the point; from the pit a groove or notch was cut across on the side of the stick. This second stick being placed horizontally in position on some dry grass and leaves, was held there by the toes of the principal operator who squatted down for the purpose. Taking the first stick between the palms of his hands and placing the point in the pit, by rubbing his palms together the stick was made to revolve backwards and forwards, and the second operator relieved the first by commencing at the top as the other worked down to the bottom. They continued thus alternately relieving one another, till, in an incredibly short space of time, the pit became charred and soon began to smoke, the fine dust resulting from the friction falling down the already mentioned slit formed a small pile on the tinder and caught the first spark. This being carefully nursed and blown upon, soon burst into a flame.

At the ethnological section of the British Association meeting in 1878 I exhibited and described some of these sticks and the communication appeared to excite a considerable degree of interest. This, added to the fact that I have found that even in India many people are not aware that the knowledge of how to produce fire with two small sticks, so far from being extinct, is probably universal throughout some wide tracts in this country—has led me to make further enquiries. On the only two occasions upon which I have been in the jungle this year I have asked the first regularly jungly men I met with whether they could make fire; both replied in the affirmative and made good their words by producing a flame in a very short space of time. The first case happened not many miles distant from Deoghur; here the sticks used were the already mentioned *pothur* (*Croton oblongifolium*): these are now exhibited. The second case occurred in the centre of the Kharakpur Hills where I came across a tribe of people called Naya. Their headman, who, by the way, was a most curious and amusing individual, on being asked to produce fire sent one of his companions for the sticks to the jungle close by. He returned, not with the *pothur*, but with the woody stems of a thorny creeper. The thorns having been removed, a pit was made at a node or joint, and then, in the usual way, a very few turns produced a spark; these sticks I also now exhibit. This creeper has three native names, *Kumari* (or *Kumree*) *Dahnee* and *Maskanti*; although I omitted to get leaves or flowers I am fully satisfied that it is a species of the genus *Smilax* and in this opinion Dr. Feistmantel agrees with me. Most of the common species of *Smilax* have scarcely got woody stems, and in this one it is noteworthy that the wood much more closely resembles that of an Endogenous, than that of an Exogenous plant.

So anomalous are the characters of the genus that Lindley long ago proposed a special class, the Dictyogens, for its reception. Among its anomalous characters I do not know whether its woody structure has been specially noticed.

There is every probability that this *Smilax* was the so-called Vine which was known to the ancients as affording the wood with which fire was produced.

Dr. Feistmantel has called my attention to a passage in Sir Emerson Tennent's 'Ceylon' (Vol. II, p. 451) in which the Veddahs are described as making fire in this way with the pieces of an arrow which they broke in two for the purpose.

Mr. Tawney referred to Professor Kuhn's 'Herabkunft des Feuers und des Göttertranks', and mentioned that it appeared from passages quoted by that writer from Greek and Latin authors, that the wood of certain creepers was preferred for kindling fire by friction. Theophrastus states that the lower of the two pieces of wood should be made of ivy, or of a creeper named ἀθραγένη, resembling the wild vine. Pliny also tells us that *edera* and *vitis Silvestris*, *alia quam labrusca*, *et ipsa ederae modo arborem scandens* were preferred for the lower of the two fire-sticks, or πυρρα as they were called by the Greeks.

It was therefore very interesting to observe that the fire-sticks exhibited by Mr. Ball appeared to be made of the wood of a creeper, and a creeper resembling in appearance the wild vine. Among the Greeks and Romans the upper stick or borer was frequently made of laurel. But it is also stated that both sticks were often of the same wood, and the wood of the thorn, the ilex, and the linden seem also to have been used. Kuhn points out that Greek, Roman, and Indian accounts represent the process of attrition as performed by the help of a thong, and not as Mr. Ball saw it, with the hands alone.

The following papers were read—

1. *On the Relations of Cloud and Rainfall to Temperature in India, and on the opposite variations of Density in the Higher and Lower Atmospheric Strata.* By H. F. BLANFORD, F. R. S., *Meteorological Reporter to the Government of India.*

(Abstract.)

The paper treated of two subjects, which had been incidentally discussed in the author's official Report on the Meteorology of India in 1879,

but which, being of general and not merely temporary interest, the author had thought desirable to recast as the subjects of a special paper for the Society.

The first of these was a discussion of the circumstances which mainly determine those marked variations of temperature, that characterize the corresponding seasons of different years in India. Adverting to a paper recently communicated to 'Nature' by Mr. Douglas Archibald, in which Mr. Archibald had shown some reasons for inferring that the cyclical variations of rock-temperature, brought to light by Prof. Piazzi Smythe, were determined by corresponding cyclical variations of cloudiness in the atmosphere, the author remarked that this view was in part identical with that which he had originally suggested in a paper read before the Society in June 1875; wherein he had endeavoured to show that the temperature of the lower atmosphere on the land surface, in India, depends more on the quantity of cloud and rainfall, than on variations of the solar intensity. Evidence bearing on this subject, drawn from the meteorological observations of the last 6 years, was then brought forward. The temperature of the air and ground as observed at Calcutta in the first five months of 1879 was contrasted with the corresponding temperatures of 1880, and the difference shown to accompany marked variations in the cloud and rainfall. Similar evidence was obtained when the temperature of the N. W. Provinces in the hot months and rains respectively of the years 1877 and 1879 were compared, the variations of the two seasons being in opposite directions in the two years compared; and these were shown, in like manner, to have accompanied very striking variations in the cloud proportion and rainfall.

The action of the different agencies which most powerfully influence temperature at different seasons was discussed briefly, with the result that, only in November and December, is the effect of cloud to raise the temperature above the normal value. At all other seasons, the effect is the opposite, and hence abnormally cloudy and rainy years are abnormally cool years.

The second subject discussed was the variations in the density of the lower and higher strata of the atmosphere, as shown by a comparison of the barometric pressures at hill stations with those on the plains. It was shown that, in many cases, the density of the lower strata of the atmosphere was below the average, when the barometric pressure as a whole was in excess of the average, and *vice versa*; indicating that the higher strata must have an anomaly of the opposite character to that of the lower. It was also shown that a similar opposition of conditions is of annual recurrence at the setting in of the rains, and that it might therefore be probably traceable to some definite play of physical causes. Then adverting to a former discussion, in which it had been shown that the principal cause



affecting the density of the atmosphere is change of temperature, after referring to a recent paper by Mr. Douglas Archibald in the Journal of the Meteorological Society of London, in which this view had been revived and established, some additional evidence was adduced in its support; and it was finally pointed out that, while, as shown in the former part of this paper, the action of cloud and rain was to lower the temperature of the lower strata of the atmosphere, their effect on the higher strata would probably be of the opposite character, which would explain and reconcile the apparent barometric anomaly in question.

This paper will be published in the Journal, Part II.

2. *Description of a Raingauge with Evapometer for remote and secluded stations (with a Plate).*—By H. F. BLANFORD, F. R. S., *Meteorological Reporter to the Government of India.*

(Abstract.)

The paper described a raingauge, intended for use at stations at which there was no resident observer, and which could only be visited at intervals of a month or more; such as were certain hill-tops and stations in forest tracts. The idea had been suggested by Mr. Hutchins of the Mysore Forest Department in an official letter, which had been sent to the author for report. He had made some additions to the design sent up by Mr. Hutchins, and a gauge had been constructed in accordance with the modified design at the Mathematical Instrument Department, and had been subjected to a year's verification at the Alipore Observatory. The result of this verification was now communicated to the Society.

The gauge only differed from an ordinary raingauge in having a very large receiver, capable of holding about 30 inches of rainfall. The receiver was surrounded by an outer casing to diminish evaporation, and, in use, was buried in the ground, the mouth being about one foot above the ground level. Accompanying it, was a smaller vessel of the same diameter, but much shallower, and covered with a conical lid having a small perforation at the apex; which was protected by a small conical cap, to prevent the entrance of rain. This served as an evapometer. In use a measured quantity of water (say = 2 inches of rainfall) was placed in both vessels, and they were then left undisturbed for a month. At the end of that time, the quantity in each vessel was remeasured. The additional water in the gauge being added to the loss in the evapometer was assumed to be the total rainfall of the interval.

A year's verification at Alipore, where the rainfall was also measured daily, showed that the instrument was less accurate than had been hoped,

but was nevertheless calculated to give an approximate result when great accuracy was not important. It had been found that the evaporation from the evapometer exceeded that from the gauge by quantities varying from  $\frac{1}{4}$  inch to  $\frac{3}{4}$  inch in different months, and the total error in ten months amounted to  $4\frac{1}{2}$  inches. The cause of the error being obvious, it appeared probable that it might be greatly reduced or even corrected by increasing the depth of the evapometer, and by enlarging the conical cap, which would diminish the evaporation.

This paper will be published in the Journal, Part II, with a Plate.

3. *On some Lepidopterous Insects belonging to the Rhopalocerous Genera Euripus and Penthema from India and Burmah.*—By J. WOOD-MASON, Deputy Superintendent, Indian Museum.

This paper will be published in the Journal, Part II, No. 2 for 1881.

4. *A list of Butterflies taken in Sikkim in October 1880 with notes on habits, &c.*—By LIONEL DE NICEVILLE.

This paper will be published in the Journal, Part II, No. 1 for 1881.

The following communication has been received—

*On the Revenues of the Mughul Empire.*—By H. G. KEENE, C. S.

## LIBRARY.

The following additions have been made to the Library since the meeting held in March last.

## TRANSACTIONS, PROCEEDINGS AND JOURNALS, presented by the respective Societies and Editors.

Bombay. The Indian Antiquary,—Vol. X, Parts 116 and 117, March 1881.

Bordeaux. Société de Géographie Commerciale,—Bulletin, Nos. 3, 4 and 5.

Calcutta. Agricultural and Horticultural Society of India,—Journal, Vol. VI, Part 3.

*Lennox, P. de Laval.*—Remarks on Cattle disease in the district of Kangra, its treatment and remedy. Notes on the preparation of the Rhea Fibre, by certain residents of the Bhagulpore district. Communicated by the Government of Bengal. *Sandys, T.*—Remarks on Rhea cultivation and preparation. *Pogson, Capt. J. F.*—Notes on the introduction of certain Food Grains and Economic Plants into the Himalayas. Notes on some neglected Fibres. Trees yielding India Rubber.

Leipzig. Deutsche Morgenländische Gesellschaft,—Zeitschrift, Vol. XXXIII, Part 4, 1880.

Lille. Union Géographique du Nord de la France,—Bulletin, Nos. 1—5, July to November 1880.

London. Royal Asiatic Society of Great Britain and Ireland,—Journal, Vol. XIII, Part 1, January 1881.

———. Statistical Society,—Journal, Vol. XLIII, Part 4, December 1880.

———. Royal Microscopical Society,—Journal, Vol. I, Part 1, February 1881.

Summary of current Researches relating to Zoology and Botany (principally Invertebrata and Cryptogamia) Microscopy, &c., including original Communications from Fellows and others.

———. Royal Geographical Society,—Proceedings, Vol. III, Nos. 1—2.

———. Institution of Mechanical Engineers,—Proceedings, No. 4, 1880.

———. Royal Astronomical Society,—Monthly Notices, Vol. XLI, Nos. 2 and 3.

———. ———. Memoirs,—Vol. XLV, 1879-80.

———. Nature,—Vol. XXIII, Nos. 590, 592 and 593.

———. The Athenæum,—Nos. 2781—2785.

———. The Academy,—Nos. 457—462.

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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
FOR MAY, 1881.

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The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 4th of May 1881, at 9. 15 p. m.

The Hon. H. J. REYNOLDS, C. S., Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Lisbon Geographical Society,—(1) *Moçambique*, by J. Machado, (2) *Explorações Geologicas e mineiras nas Colonias Portuguezas*, by L. Malheiro.

2. From the Department of the Interior, U. S.—Annual Report of the U. S. Geological and Geographical Survey of the Territories for the year 1877.

3. From the Meteorological Reporter to the Govt. of India—*Description et notices sur l' installation et l'entretien des Météorographes voyageurs de von Rysselberghe et Schubart, construits pour compte du Ministère des Indes Britanniques*, by Th: Schubart.

4. From the authors,—(1) *Notice sur une collection de Monnaies orientales de M. le Comte S. Stroganoff*, by Prof. W. de Tiesenhhausen, (2) *The Tea Cyclopædia*, by F. Wyman, editor of the Indian Tea Gazette.

5. From the Home, Revenue and Agricultural Department,—*Selections from the Records of the Government of India, Home, Revenue and Agricultural Department*, No. 174.

6. From the Museo Publico of Buenos Aires,—(1) *Bericht über die Feier des 50 Jahrigten Doctor Jubilaeums des Prof. Dr. Hermann Burmeister begangen der 19th December 1879 in Buenos Aires*, (2) *Description Physique de la République Argentine*, Vol. III, and Atlas Part 2, Dr. H. Burmeister.

7. From the Royal Society of New South Wales,—Report of the Council of Education of New South Wales for 1879, (2) Annual Reports of the Department of Mines, New South Wales, for 1878 and 1879.

8. From Dr. A. F. R. Hoernle,—*Bibliotheca Orientalis* for 1877, by R. Frederici.

The following Gentlemen, duly proposed and seconded at the last meeting, were balloted for and elected Ordinary Members of the Society :

J. Cockburn, Esq.

Major E. Molloy.

The COUNCIL reported that Mr. V. Ball had been asked to officiate as Natural History Secretary during Mr. J. Wood-Mason's absence on deputation.

The COUNCIL also reported that Mr. Alexander Pedler had resigned the post of Honorary Secretary and Member of Council and that Dr. H. W. McCann had been appointed in his place.

The COUNCIL also reported that Mr. Pedler had resigned the post of Trustee of the Indian Museum on behalf of the Society and that Mr. J. Eliot had been elected a Trustee.

The SECRETARY reported that Babu Mahendra Chandra Mukhopadhyaya had been appointed as a temporary copyist in the office on Rs. 15 per mensem.

The SECRETARY read the names of the following Gentlemen appointed by the Council to serve on the several Committees during the year 1881.

#### FINANCE COMMITTEE.

Dr. Rájendralála Mitra, C. I. E.

J. Westland, Esq., C. S.

H. B. Medlicott, Esq., F. R. S.

H. Beverley, Esq., C. S.

J. Eliot, Esq., M. A.

#### LIBRARY COMMITTEE.

Dr. Rájendralála Mitra, C. I. E.

H. B. Medlicott, Esq., F. R. S.

Col. J. F. Tennant, R. E., F. R. S.

Dr. D. D. Cunningham.

C. H. Tawney, Esq., M. A.

Babu Prannath Pundit, M. A.

H. F. Blanford, Esq., F. R. S.

Dr. O. Feistmantel.

J. Eliot, Esq., M. A.  
 H. Beverley, Esq., C. S.  
 Dr. Mohendralal Sircar.  
 Babu Pratapa Ch. Ghosha, B. A.

PHILOLOGICAL COMMITTEE.

Dr. Rájendralála Mitra, C. I. E.  
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 Major-General A. Cunningham, C. S. I.  
 J. Beames, Esq., B. C. S.  
 F. S. Growse, Esq., M. A., C. S.  
 Rev. K. M. Banerjea, LL. D.  
 Dr. Mohendralala Sircar.  
 Dr. G. Thibaut.  
 Hon'ble Whitley Stokes, C. S. I., C. I. E.  
 C. J. Lyall, Esq., B. A., C. S.  
 G. A. Grierson, Esq., C. S.  
 H. Rivett-Carnac, Esq., C. S., C. I. E.  
 Nawab Abdul Latif, Khan Bahadur.  
 Moulvie Kabiruddin Ahmed.  
 Babu Dijendranath Thakur.  
 Babu Prannath Pandit, M. A.  
 Babu Protapa Ch. Ghosha, B. A.  
 Major H. S. Jarrett, S. C.

NATURAL HISTORY COMMITTEE.

Dr. O. Feistmantel.  
 A. O. Hume, Esq., C. S.  
 G. Nevill, Esq., C. M. Z. S.  
 Dr. D. D. Cunningham.  
 Dr. G. King, F. L. S.  
 Dr. D. Brandis, F. L. S., F. R. S.  
 S. E. Peal, Esq.  
 R. Lydekker, Esq., B. A.  
 Capt. G. F. L. Marshall, R. E.  
 L. Schwendler, Esq.  
 Dr. T. R. Lewis.

PHYSICAL SCIENCE COMMITTEE.

H. B. Medlicott, Esq., F. R. S.  
 Major-General J. T. Walker, R. E., F. R. S.  
 H. F. Blanford, Esq., F. R. S.  
 A. J. L. Cappel, Esq.

J. Eliot, Esq., M. A.  
 Col. J. F. Tennant, R. E., F. R. S.  
 Commander A. D. Taylor.  
 L. Schwendler, Esq.  
 F. Fedden, Esq.

## COINS COMMITTEE.

Dr. Rájendralála Mitra, C. I. E.  
 Col. J. F. Tennant, R. E., F. R. S.  
 Major-General A. Cunningham, C. S. I.  
 H. Rivett-Carnac, Esq., C. S., C. I. E.  
 Hon'ble J. Gibbs, C. S. I., C. I. E.  
 C. H. Tawney, Esq., M. A.  
 Major W. F. Prideaux, S. C.

The SECRETARY read the following table of predictions for Northern India for the Eclipse of the sun May 16th, 17th, 1882, sent by Col. J. F. Tennant, F. R. S.

## ECLIPSE OF THE SUN, MAY 16, 17, 1882.

## PREDICTIONS FOR NORTHERN INDIA.

Places.	COMMENCEMENT.		GREATEST ECLIPSE.		END.	
	Mean Time.	Position.	Mean Time.	Magnitude.	Mean Time.	Position.
	h. m.		h. m.	Digits.	h. m.	
Allahabad .....	0 „ 24.1	121° R.	1 „ 54.8	6.314	2 „ 15.3	14° R.
Calcutta .....	1 „ 14.9	142 R.	2 „ 38.8	5.780	3 „ 50.7	20 R.
Delhi .....	23 „ 48.0	72 R.	1 „ 22.6	7.800	2 „ 49.4	6 R.
Jubbulpore .....	0 „ 13.2	119 R.	1 „ 42.1	5.687	3 „ 02.8	24 R.
Kurrachee .....	22 „ 37.1	9 R.	0 „ 08.8	6.730	1 „ 41.1	19 R.
Lahore .....	23 „ 28.3	61 R.	1 „ 03.0	8.878	2 „ 32.0	4 R.
Lucknow .....	0 „ 15.6	109 R.	1 „ 47.9	7.154	3 „ 00.5	10 R.
Mooltan .....	23 „ 07.3	39 R.	0 „ 46.8	7.040	2 „ 14.1	4 R.
Mussooree .....	23 „ 53.5	82 R.	1 „ 27.4	8.480	2 „ 54.5	1 L.
Patna .....	0 „ 47.0	133 R.	2 „ 16.0	6.786	3 „ 34.6	12 R.
Peshawar .....	23 „ 09.7	62 R.	0 „ 44.4	10.136	2 „ 15.9	16 L.
Shillong .....	1 „ 33.1	142 R.	2 „ 57.8	7.146	4 „ 11.2	8 R.
Simla .....	23 „ 46.6	78 R.	1 „ 21.7	8.740	2 „ 48.7	3 L.

*N. B.*—Positions are measured on the circumference of the Sun and to the Right or Left of the Highest point.

Dr. HOERNLE exhibited a collection of relics which had lately been found by Mr. Beglar in the course of an excavation carried on in the Great Temple of Buddha Gaya. Permission to exhibit them to the Society had been re-

ceived from the Lieutenant-Governor, shortly before the meeting ; and Dr. Hoernle explained that he was not in a position to give more information about them than what he had been able to gather in a short conversation with Mr. Wickes from whom he had received the relics. They were said to have been found in the Great Temple at a spot where according to local tradition the throne of Aśoka once stood, after digging to a depth of about 20 feet. They consisted of fragments of various kind of gems, corals, gold and silver foil, small pearls, &c. A very large number of them were perforated, showing apparently that they were originally strung on threads. Dr. Hoernle added, that it appeared to him that the theory of their connexion with Aśoka's throne required a great deal of confirmation ; and that it would be well to wait for General Cunningham's report, to whom, he understood, the relics had been already submitted, before accepting the local tradition.

Mr. Ball, who had examined the relics, concurred with Dr. Hoernle as to the doubtfulness of their connection with any throne of Aśoka. The result of his examination, as communicated in a letter after the meeting, is as follows :

"The collection includes sapphires, (whole and broken), rubies, emeralds (broken), pearls, coral, cornelian, garnet, quartz crystals, lapis lazuli, &c. There are also some heart-shaped pieces of emerald-like glass which have become crusted over from lying in the soil.

"There are at least two specimens, one large, of a rare mineral called Iolite or Dichroite. These have been identified by Mr. Mallet to whom I shewed them. They at first sight look like sapphires.

"The larger one would be a valued specimen in our mineralogical collection if it could be obtained.

"The smashing of the sapphires into small pieces is remarkable. There are a few, however, which are intact."

Mr. WESTLAND exhibited four old maps of Calcutta and Bengal which he explained had been lithographed for issue with Mr. Sandeman's continuation of Mr. Seton-Karr's extracts from old Calcutta Gazettes. Mr. Sandeman had left them behind him, in his, now Mr. Westland's, office, and Mr. Westland thought he would best dispose of them if he offered them to such members of the Society as had any interest in the subject.

The first was a map of the Sunderbuns in 1724, apparently a rough sketch by some Dutch skipper. It had been occasionally referred to as evidence of the extension of cultivation in these regions ; but some difficulties had been found in identifying some of the settlements named in it. One of them called "Cuipitavai" he identified as "Khalifatabad" the pergunna in which Bagahat was situate, near which there were some ancient and large buildings, indicating an early cultivating settlement. "Noldy" farther east

was no doubt meant for Pergunna Nuldi in Jessore, which, however, was a good way north of its position in the map, and did not properly belong to the Sunderbuns at all. The "Jessore" mentioned in the map was probably either the original "Jessore" in the 24-Pergunna district, or the place now known as Khoolna. The present "Jessore" was not known by that name till 1780 or 1790 at the earliest.

Another map was a reproduction of a map of Bengal engraved in 1776 from surveys in 1769. Mr. Westland drew attention to the fact that the various districts all bore their territorial names as distinguished from their official ones,—thus, Pachete for Manbhoom, Ramgur for Hazaribagh. He drew attention also to the great change in the Gangetic Delta which had occurred since the date of the map. The Brahmaputra river which the map shewed as flowing east of the Maddapur jungle, Dacca, and the Gangetic Delta, now flows west of the jungle and Dacca, and breaks in on the north of the Delta. He connected this with another change of which he had independent historical evidence, namely, the opening of the Madhumati branch of the Ganges, a petty stream in this map, but now receiving by far the largest share of the Ganges water. The Ganges had now ceased to find its way farther east, being interrupted and thrown back by the irruption of the altered Brahmaputra into the Megna. He dated these changes between 1795 and 1805, which were years of excessive inundation in the northern district of the Madhumati.

The two other papers were, one a sketch of Calcutta in 1756, and the other a plan of it in 1757. He drew attention to the grouping of the settlement round the Fort (on the present Customs House site) and the Park (now Tank or Dalhousie Square); and to the creek running up along the line now occupied by the High Court, Government House, and Dhurumtolla; the recollection of which he believed was still preserved in the name of a small street "Creek Row".

Mr. Beverley said that the two maps of Calcutta exhibited by Mr. Westland were apparently reprints of maps that were first published in Orme's *History of the War in Bengal*. They had been treated of by him (Mr. Beverley) in para. 104 of his *Report on the Census of the Town of Calcutta* (1876), which he read. Mr. Beverley believed that all the old maps of the Town now in existence in Calcutta had been referred to in that *Report*. He had hoped that Mr. Westland had come across Holwell's map of 1756, described by him in a letter to the Court of Directors as "an exact plan of your Settlement and of every house in it." That map ought to be in the India Office, and its publication would throw considerable light on the early history of the town. Possibly the Society might take steps to have it traced out, and to have copies sent to this country.

The following papers were read—

1. *On the Revenues of the Mughul Empire.*—By H. G. KEENE, C. S.

(Abstract.)

The Journal of the Asiatic Society of Bengal, Part I, No. IV, 1880, contained a paper by Mr. C. J. Rodgers on the copper coins of Akbar. The object of the present paper is to show that Mr. Rodgers' views regarding the amount of Akbar's revenue are not tenable, and for this purpose various evidence is adduced from historical writings (*e. g.*, the *Bádsháh-námah*) and general considerations. The conclusion at which the author arrives is, that "ten krores are the right figure of Akbar's Revenue, and that the *muráli tankah* is neither the one-fifth of a *dám*, nor the modern 'double pyce,' but an imaginary integer of copper accounts, whereof sixty-four equal one silver Rupee."

This paper will be published in the Journal, Part I.

2. *On the origin of the Myth about Kerberos.*—By DR. R. MITRA.

The earliest notice of dogs as warders at the entrance of Hades occurs in the *Saṁhitá* of the *Rig Veda*. Yama, the regent of that region, it is said, had two canine attendants, each having four eyes, and these brought the dead from the earth to the nether regions. The passages in which they are mentioned are short and sometimes obscure, but their purport is clear enough. The most important of those passages runs thus "(O Agni) hasten on by an auspicious path, avoiding the two four-eyed brindled dogs, the offspring of Saramá. Then approach the bountiful Pitris who dwell in festivity and with Yama. (To Yama) place the spirit under the care of thy two four-eyed dogs which guard the roads and thy mansion, and whom men avoid, and keep it in ease and free from disease. The two brown messengers of Yama, broad of nostrils, delighting in other's life, and of great power, wander about among men. May they give us again the auspicious breath of life, that we may again behold the sun." (*R. V.* XV, 10—12). These are quoted in the *Yajur Veda*, and their counterparts occur in the *Atharva Veda*. The later literature of the Hindus casually, but very obscurely, refers to them. Thus in the *Mahábhárata*, Yudhisṭhira in his way to heaven is said to have been led by a dog. These dogs are either called *Svānau* "two dogs," or *Súrameyau*, "the two sons of Saramá," the Dawn.

In Greek mythology the story of the dogs occurs repeatedly, and is well known to classic scholars; but for purposes of comparison it is necessary that a few of its salient points should be noticed here. The oldest notice of a dog as the warder of Hades is to be found in the *Iliad* of Homer where Héraklés refers to his "Haling out hateful Pluto's dog from darksome Erebos."



ἐξ Ἑρέβους ἄζοντα κύνα στυγέου Ἀΐδαο. (θ 368).

In the *Odyssey* (XI, 626) the subject is referred to when Héraklés tells Odysseus that his sufferings are but a reflection of the toils which Héraklés himself had undergone.

- “Of all which one was, to descend this strand  
And hale the dog from thence. He could not think  
An act that danger could make deeper sink,  
And yet this depth I drew, and fetch'd as high,  
As this was low, the dog.”

(*Chapman's translation.*)

In neither place the name of the dog is given; but Hesiod (III, 11) calls him Kerberos, and assigns him fifty heads. Apollodoros, Euripides and Virgil reduce the number of heads to three; while some poets prefer to call the animal “many-headed” or “hundred-headed” (Horat. *Carmin.* II, 13, 34. Tzetz. *Lycoph.* VI, 78. Seinec. *Herc. fur.* 784). Apollodoros says that the tail of this animal was formed by a serpent, and the mane by a number of snakes of various kinds. It was begotten by Typhon and Echidna. Hesiod describes another dog of the same parentage, and assigns him to Geryones (293). Thus the Greeks had two dogs, the counterparts of the Vedic Sárameyau. Orthros was the shepherd dog which Héraklés destroyed, and was frightful enough to be reckoned a monster whose destruction would reflect credit on the great hero: the feat represents his eighth labour. This dog is the counterpart of the Vritra of the Vedic legend. He did not, however, attain to any distinction, and was soon forgotten. Kerberos, on the other hand, played a prominent part in Hellenic mythology. As the three-headed monster watching the gate of Hades, it was very much dreaded, and as a dog, like every other dog, was detested by the Greeks.

The belief was that he did no harm to those who entered the mansion of Pluto, but tore up those who attempted to escape from it. This is, however, not in keeping with the legend which says that he growled fiercely when Orpheus was entering the portals of Hades, and had to be lulled by the enchanting music of that gifted harper. One of the greatest feats of Héraklés was the dragging out of the monster from his nook, and this could not be effected without the assistance of such divine personages as Athéné and Hermés.

The three heads of the animal were not peculiarly its own, for Hermés had the same number of heads, whence his name ‘Trikephalos,’ and so had Hekaté ‘triformis.’ According to Bryant the meaning of Kerberos is “darkness” (ἐρεβος)—the darkness of Hades or of night, the Sanskrit equivalent being *Sarvara* or *Sambara*, night slain by Indra.

In Norse legends—as in Baldur's Dream in the elder Edda—the animal is described as “spotted with blood on his front and chest.”

In the Vendidad it finds a prominent place; nor was it unknown among some of the Turanian and Semitic nations.

The belief in it turns up, curiously enough, among Algonquin tribes of the North American Indians, who say that at the further approach of the snake bridge across the river of the dead there is a warder in the form of a great dog.\*

Local colouring and minor details apart, the myth is the same everywhere, and its wide dispersion bespeaks its extreme antiquity.

But what it means has not yet been satisfactorily settled. According to some Kerberos is a symbol of all-devouring time, and the three mouths of the animal represent the present, the past, and the future. Milton accepted it in the sense of man's conscience, which preyed within him for his past misdeeds. Others believed it to be the symbol of earth, or of the human passions, the victory of Héraklés denoting the conquest which he achieved over his passions. Bryant takes Kerberos to be the name of a place—and it signified the temple of the sun, deriving it from *Kir-abor* “the place of light.” The temple was also called *Tor-caph-el*, which, it is alleged, changed to Trikephalos.

The latest theory is that it is an offshoot of the far-reaching solar myth which peopled the eastern and the western heavens with such an endless variety of gods and goddesses. According to this theory, the gloom of the morning and the evening represents the two dogs. (Max Müller, ‘Science of Language,’ Second Series, p. 478.) The learning, ingenuity and tact with which this theory has been worked out leaves little to be desired. Philological evidence on the subject is overwhelming, and the coincidences are most remarkable. And yet the enquiry does not seem to be complete. The myth of Kerberos may be due to Saramá = Echidna, the prolific mother of so many romantic stories; but the question remains why was the story elaborated? and what gave occasion to its repulsive character? The Dawn is justly associated with every thing that is charming and full of life; why should it be brought into contact with death and destruction? Divested of its mythological surroundings, the substance of the story is made up of the presence of dogs at the time of transition from life to eternity; this is ill explained by the melting of the gloom of night by the appearance of Dawn. The dog is made the son of Dawn, or darkness proceeding from light, and not light proceeding from darkness. Solar influence moreover always typifies exuberant vivification, and not death. It is by itself quite inexplicable why the glorious and resplendent Dawn should bring forth two ugly puppies. If we take man's life to be the counterpart of the life of the

\* Tanner's Narrative, p. 290; Schoolcraft, Indian Tribes, III, 233.

sun, in dawning beauty, in midday glory, in evening death, and the myth of the sunset to represent the close of life, the dogs could scarcely be called the sons of Dawn, for they would come with the gloaming, and not with the rising sun. It may be said that the word U'shá = Dawn is used for all the three stages of the sun's course, and the succession of the night to the resplendence of the setting sun is what is meant by the affiliation; but neither Saramá, nor Hermés, nor Echidna, is associated with the gloaming. I am disposed to think, therefore, that the solar theory is not by itself sufficient to solve the question. There was something else—something gross and material—in the life of the ancient Aryans which gave rise to the story, and which was subsequently associated with the current solar mythology. And this something I fancy was connected with the funeral rites of the time.

In the most primitive state of human society the simplest and most convenient mode of disposing of the dead was to fling it into the nearest jungle or wild place, either to rot there, or to be eaten up by wild animals. Carrion birds, jackals, foxes and dogs were the animals which were attracted by such castings, and dogs, which had been domesticated at a very early age, were necessarily associated with the disposal of the dead. In this plan of funeral the element of chance predominated, for it was quite uncertain when the destruction would be completed by stray animals. To obviate this uncertainty, the most primitive form of funeral was, it would seem, at one time so far modified as to facilitate the consumption of the dead in a short time by enticing wild dogs, or employing domestic dogs, for the purpose. Such an expedient would not be by any means extraordinary. In the present day the Pársis carry vultures to such places where there are none, in order that they may be ready at hand to consume the dead in their Towers of Silence. Such enticement or employment of dogs often repeated would consolidate into a tribal or national custom, and the cutting up of the corpse to facilitate rapid consumption would be an innovation that would be easily introduced.

That such a horrible form of funeral did obtain, and still obtains, in some places is unquestionable. According to Herodotus (Lib. I) "the body of a male Persian is never buried until it has been torn either by a dog or a bird of prey. That the Magi have this custom is beyond a doubt, for they practice it without any concealment". (Rawlinson's Herodotus I, 140 §). We have the authority of Strabo (Lib. XV) to show that the practice of exposing corpses to be devoured by dogs was current among the Sogdians and the Bactrians, who on this account named their dogs "buriers." Cicero noticed the same among the Hyrcanians. He says—"In Hyrcania plebs publicos alit canes; optimates, domesticos. Nobile autem genus canum illud scimus esse. Sed pro sua quisque facultate

parat, a cuius lanietur: eamque optimam illi esse censent sepulturam." (Quart. Tuscul. Lib. I, 45.) The same custom also obtained among the Parthians, and Justin says "Sepultura vulgò aut avium aut canum laniatus est." (Lib. XLI, cap. 3.) Prejvalsky has seen it among the Northern Mongolians, where "the dead bodies, instead of being interred, are flung to the dogs and birds of prey. An awful impression is produced on the mind by such a place as this, littered with heaps of bones, through which packs of dogs prowl like ghosts to seek their daily repast of human flesh." (Mongolia. translated by E. D. Morgan, I, p. 14.) Horace della Penna, a Capuchin friar, found at Lhassa, in 1719, the practice of cutting up corpses to be given to dogs to be very common; and Abbé Huc found it among the Tibetans only a few years ago. At the last named place Huc noticed four different forms of sepulture, of which he says, "la quatrième, qui est la plus flatteuse de toutes, consiste à couper les cadavres par morceau et à les faire manger aux chiens. Cette dernière méthode est la plus courue". A reminiscence of this practice is still extant among the Pársis. Their funeral ritual requires that when a corpse is brought to the Dakhmá, or the place where it is to be given up to vultures, it should be first exhibited to one or more dogs, which, I noticed at Bombay, are kept there for the purpose. This ceremonial is called *Sagdíd*, and is strictly observed as it is enjoined in their scriptures. (Vendidad, Farg. VII, v. 3.) That this is a relic of the former detestable custom noticed by Herodotus is evident from the fact of the said scriptures enjoining the exposure of corpses on tops of hills that dogs and carrion birds may see and devour them (Vendidad Farg. VII, vv. 73. 74).

And since this detestable practice exists now, and did exist three thousand years ago and earlier, there is nothing very presumptuous in the supposition that it existed among the Aryans in their common home in central Asia, before their dispersion to Europe and India, between four and five thousand years ago. From these Aryans the Pársis have derived their custom of giving up their dead to be devoured by vultures, and exhibiting them to dogs, and from them has come the myth of dogs at the portal of death.

If on the strength of these arguments it could be assumed that the custom of consigning corpses to dogs did at one time prevail among the Aryans, the details of the myth could be easily and very consistently explained. The idea of Eurytheus sending Héraklés to destroy a dog that did not exist on earth, and consequently did no harm to any body is a very fanciful, not to say an unmeaning one. But if the above theory be accepted, it would follow that the story is a mythical representation of Héraklés having been the first to set about putting a stop to the barbarous practice of casting the dead to dogs, though the attempt did not prove

ultimately successful, for, according to the fable, Héraklés restored the dog to its place at the infernal gate. Not that Héraklés was an entity, for even Herodotus rejected some of his exploits on physical grounds, but the mythical embodiment of the good actions of man. Similarly the Orpheus myth would suggest the idea of the repugnance which men must have felt in allowing their loved ones (symbolised in the story in the person of Eurydiké) to be eaten up by such hateful animals, and of an attempt—an unsuccessful one again—to put down that custom. It might be that the myth of Orpheus belongs to the same class with that of Bacchus recovering his mother Semelé from Hades, and of Ulyseus, Odin and others visiting Hades, in which the original idea is of Hades being accessible to mortals under certain circumstances. The three or more heads of Kerberos may be accepted as implying plurality, or many-sided watchfulness, or both; and the quadruple eyes of the Vedic legend typify the same idea. The serpent's tail and the snaky mane of the dog would be the instruments with which corpses were cut up into small morsels. The association of Kerberos with the Dawn by making him the son of Dawn = Saramá = Echidna implies that the removal of the dead in primitive times was generally effected at early morn. It was so among the Greeks; it is still the case with the Parsis and Tibetans. Ancient Hindus absolutely prohibited cremation at night, and in a verse of Yama, quoted in the Nirṇayasindhu, it is said, "Let not cremation, the first śráddha and travelling be performed at night or at dusk, for if done they would be fruitless."\* This is not now strictly followed, and to provide for it, a later authority, the Skanda Purāṇa, ordains that "should the cremation be commenced at night it should not be completed until day dawns, so that the offering of water and other rituals may be accomplished in daylight".† The idea was carried further by declaring death at night to be unwelcome. Thus in the Bhagavadgītā, "Should a person die in gloom, at night, during wane, or in course of the six months of the southern declension of the sun, he would go to the region of the moon, and then return to the earth, (but never attain salvation)".‡ Manu indirectly explains the

\* सन्ध्यायां वा तथा रात्रौ दाहः पाथेयकर्म्म च ।

नवव्याहस्य नो कुर्यात् कृतं निष्कलतां व्रजेत् ॥

यमवचनं ।

† यदि रात्रौ दहेत् तस्य समाप्तिर्दहनस्य तु ।

परिहृद्युदिते स्वर्ग्ये कार्यं तस्योदकक्रिया ॥

स्नानवचनं ।

‡ धूमो रात्रिस्तथा कृष्णः षष्मासा दक्षिणायनं ।

तत्र चान्द्रमसं ज्योतिर्योगी प्राप्य निव्रजते ॥

गीतावचनं ।

object of the prohibition by saying that night is the time for sleep and day for work, and since the wane represents the night of the Pitris, and the southern course of the sun the night of the Devas, offerings at those times are not received by them. Most Smṛitikāras have quoted these verses as authorities.

With these elements at hand the construction of the myth would be perfectly intelligible, and the course of its development would be easily accounted for. That such was really the case it would be impossible in the present state of our information to assert with absolute certainty; but that the theory affords a natural and consistent solution of a very puzzling question, I am disposed to fancy, will be generally admitted. Were it otherwise, still there would be little to undo the explanation here attempted. It is not necessary to look for entire and absolute consistency in all the details of the story. Neither Hindu nor Greek Mythology was a system designed to be consistent in all its parts. The fables took their rise from various causes, under different circumstances, to elaborate particular facts or ideas, impressive sights or vivid impressions, play on words or poetical thoughts, and gradually they came to be digested, very crudely at best, as a system. Or, as Max Müller very aptly says, "there were myths before there was Mythology, and it is in this, their original and unsystematic prevalence, that we may hope to discover the genuine and primitive meaning of every myth". ("Chips" II, p. 147.) The question is, did the first germ of the story proceed from a very obtrusive fact, a funeral, which was afterwards worked out into a story, or a mere poetical idea, from the first start? and all I contend for is, that the former branch of the alternative appears more likely to be true than the latter.

Mr. Westland remarked on the fanciful nature of the two derivations given by the learned doctor, one of which would make Kerberos mean "The darkness of Erebus" and the other "the temple of Light". He objected to Hercules, himself a solar myth, being clothed with flesh and made to appear as an actual reformer of funeral customs. He also pointed out that whether the solar-myth theory was right or wrong, nothing in the learned doctor's paper came in proof or in disproof of it; inasmuch as that paper was devoted to shewing the origin of the idea of the dog himself, whereas the Solar-myth theory only pretended to shew how the dog, having been originated, was clothed with certain attributes.

Dr. Mitra explained that the derivations were not his own, but obtained from leading authors, and that the mythical character of Hercules did not in any way affect the question at issue. The attempt was to resolve one or more myths into their primary elements and not to preserve their entity.

3. *An account of the excavation of a mound called Jowhri Di, near the village of Inadpur, in the Muzafferpore District.—*

*By J. E. LINCKE, C. E.*

(Abstract.)

The mound is some 100 feet square and some 10 feet high with a few very ancient peepul trees growing on it. A drift which was run from the east at the level of the natural ground into the mound brought to light a wall, 4 feet deep and 4 feet broad, and beyond it a flooring of bricks on a thin layer of sand. Similar drifts were made from other sides, with a similar result. Thus the three sides of a square fort were laid bare, with a sort of solid bastion at the south-west corner and a porch in the centre of the east wall. On the fourth side of the fort, no remains of a wall were discovered. Part of the brick flooring in the middle of the fort was removed and a well dug 4 feet deep, disclosing evidences in the shape of broken brick and pottery of the mound having been artificially made. Of the superstructure nothing certain is known. There is said to have been once a tower, three stories high. Tradition says that there was a fort and town of the Cherú Rája at this spot, long anterior to the Muhammadan conquest, and that the last Cherú Rája having been defeated in battle destroyed himself and his family and treasure with the castle which was burnt. Specimens of the antiquities found during the excavations were sent with the paper and exhibited to the meeting. They consisted of highly glazed pieces of broken pottery, remains of clay-toys or votive figures, clay spindle whorls (such as noticed by Mr. Rivett-Carnac, in the Journal of 1880), pieces of bone, etc. The last were identified as those of a turtle. Two brass figures of Vishṇu and Ganēṣa were also sent to be exhibited. They had been obtained by Mr. Lincke from a villager, who said he had dug them up in a field near the mound. The figures bear, at the foot, short inscriptions, the form of the letters of which shows that they are comparatively modern. The inscription on the figure of Krishṇa reads हरिनिवे० दे० धर्म० abbreviated for हरिनिवेदन देय धर्म i. e., "a religious gift dedicated to Hari". That on the figure of Ganēṣa is too badly cut to be clearly read, but the first word appears to be *Kanha* the name of the donor; the last two are *deya dharmma* "a religious gift".

Specimens of the antiquities found in or near the mound were exhibited at the meeting.

This paper will be published in the Journal, Part I.

## LIBRARY.

The following additions have been made to the Library since the meeting held in April last.

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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
FOR JUNE, 1881.

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The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 1st June, at 9-15 P. M.

The Hon'ble H. J. REYNOLDS, C. S., Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Marine Survey Department,—Chart of Bankot and entrance to Mhar or Savitri River.

2. From the Bengal Government,—(1), Report on the Amaravati Tope and excavations on its site in 1877, by R. Sewell; (2), Selections from the Records of the Government of India, Home, Revenue and Agricultural Department, No. 174.

3. From the Authors,—(1), Kaiser Akbar, Part II, by Graf. F. A. Noer; (2), Report on the Census of Calcutta taken on the 6th April 1876, by H. Beverley; (3), The Indo-Aryans, their History, Creed and Practice, by Ramachandra Ghosha.

4. From the Magistrate of Fatehpur,—A pice of Shah Alam's reign.

The following Gentleman is a candidate for ballot at the next meeting—

Prince Firukh Shah, proposed by Moulvie Kabiruddin Ahmad, seconded by J. Eliot, Esq.

The SECRETARY reported that Mr. C. E. Buckland had intimated his desire to withdraw from the Society.

The COUNCIL reported that during Dr. M'Cann's absence for a month from Calcutta, Mr. J. Eliot had been asked to officiate as Honorary Secretary.

Mr. C. H. TAWNEY exhibited a rare coin of Sophytes and said—

“While looking through a bag of coins, brought me by Dr. Hoernle, who is engaged in arranging the Society's collection, I found a coin of Sophytes, precisely resembling that described by General Cunningham in the VIth volume of the Numismatic Journal, p. 220 and ff. General Cunningham says the coin is extremely rare. Von Saket in his *Nachfolga Alexander's des grossen*, p. 57, marks it as RRRR. The coin seems to me to be genuine, and I have therefore thought it advisable to exhibit it to the members of the Society. I should propose that it be sent to General Cunningham for his opinion.”

The following papers were read—

1. *On the Voles (Arvicola) of the Himalayas, Tibet and Afghanistan.*—By W. T. BLANFORD, F. R. S., &c., with two plates.

(Abstract.)

In this paper the author gives an account of all the Himalayan, Tibetan and Afghan Voles (9) which have hitherto been described, and for this purpose the author has examined all the type specimens.

The molar teeth of the available forms are figured and described in this paper.

Mr. Blanford considers it very doubtful that any Vole has ever been found in the Oriental region.

This paper will be printed in the current volume of the Journal, Part II, No. 2.

2. *On *Myospalax fuscicapillus*, Blyth.*—By W. T. BLANFORD, F. R. S., &c.

(Abstract.)

This is a description of a small rodent which was named by Mr. Blyth 40 years ago. The original specimen was obtained at Quetta and another from Afghanistan having been recently found among the collections of the East India Company which have been transferred to the British Museum, Mr. Blanford has compared them and gives a very full description of the species and its affinities.

This paper will also appear in the Journal, Part II, No. 2.

3. *Notes on the Inhabitants of the Nicobars.*—By F. A. DE ROEPSTORFF.

In the Proceedings of the Asiatic Society of Bengal for July 1876 and for January 1881 will be found two papers in which I called attention to the inland tribe of the Nicobars. Since my paper was printed in January, a very interesting expedition was made by Colonel T. Cadell, V. C., Chief Commissioner of these islands, and myself, interesting to us and I hope also to the members of the Society. After my success in visiting an

uninhabited village and in opening communication with a Shombeng in October last, Colonel Cadell visited Galathea bay in December with the special intention of visiting the inland tribe on the Galathea river, which had been proved to be there by the members of the Danish Expedition in 1845. The weather was, however, very boisterous, and the coast people could not be prevailed on to act as guides, and the attempt had to be given up.

In March last Colonel Cadell went on another inspecting expedition to the Nicobars, and I was attached to it. After visiting Little Brother, Andamans, Car Nicobar, we anchored at Nancowry and provided ourselves with a guide from there. Next day we visited Pulo Condul, and I prevailed on one of the principal men there to come with us: here we bought a canoe. On the evening of the 15th March, we anchored near the village Laful and at once made arrangements with the natives that they should next day conduct us inland, but this time right up into the country of the Shombengs. During the night we had some heavy showers, and when we started in the early morning it was with doubt as to whether we would be troubled with rain. The rain did not fall and the clouds made our ascent cool and nice. As there was a little surf, we had to land in a canoe that the guides had brought on board the evening before. The Coast-people are as a rule not quick in their movements, but this morning they were very punctual, and within ten minutes after landing we had the luggage deposited on a canoe and we with our two men and five Laful guides were carrying the canoe over the bar at the entrance to the creek. The ascent we made was over the same ground that I had gone over in October and mentioned in my paper of January. The only difference was that we had then ascended the stream in a pouring rain, the stream was swollen, the boulders slippery, I was then panting with fever, and we were neither provided with food nor with clothes. Now the stream was dry, the sky clouded, we were well provided with all we needed ourselves, and, although we left too quickly to provide our guides with any thing, we trusted to the gardens of the Shombengs to supply them.

We passed up the creek, landed, saw the village of the Coast-people, went through the same deserted village of the Shombengs that I visited in October, struck the dry stream and ascended it as on my former visit. Near the spot where we then halted, we came across a little new clearing of the Shombengs which was not there in October. There was only one hut, and here we saw for the first time the very curious cooking arrangement of the Shombengs, which the Galathea Expedition in 1845 came across and describes as follows: "Such a sheet of bark also formed the substance of their cooking-pot, which stood on a stand formed of four little sticks with cross-sticks, under which the fire was laid." Under the little hut in this place there was a bark-pot. It was formed of one sheet of bark bent together.

The open seams were closed by two little sticks on each side which were tied together and had a crosstree to hold them in position. The seams were tightened with clay and the bottom was steadied with ribs like those of a boat. This pot had been exposed to fire. After resting a little here we went on and came at last to the point where we should leave the main stream. Our party was by this time smaller, as two of our Laful guides had gone on ahead to warn the Bengs of our approach. Where a steep hill-waterfall (now dry) opened into the stream-bed, the men deposited the luggage, saying that they would leave it here for the Shombengs to carry up as the hills were too steep.

This boded well, for it showed that they expected the Shombengs would be friendly, that we were not very far off, and also that they put confidence in the people we were going to. We then went up the side-branch and ascended what in the rains must be an inaccessible fortress. The path we found some 1000' up the nullah and it led us up nearly perpendicularly. Along the path were creeping bamboos that were very trying. The road was very steep and straight, and the distance was not proportionate to the fatigue in ascending. At the top of the hill we came on an enclosed village of three houses lying just on the outskirt of an extensive clearing that had been made quite lately, for many of the trees were not yet dry.

The distance we had gone over was computed as follows :

In canoes up the creek about .....	1½ mile.
Up the stream to first Beng village .....	1 "
Up the stream to second " .....	1 "
To where the luggage was deposited .....	½ "
Up the steep hills .....	1½ "
The total was thus 5½ miles in a west, slightly south, direction.	
Height ascended above the sea :	
Ascending the stream more than .....	300'
By the hill ascent about .....	1200'

Total probable ascent ... 1500'

The village was enclosed by a stockade consisting of split logs, a horizontal piece alternately with one where the logs were in a vertical position. There was no entrance to this enclosure and it had to be climbed: it was about 3' high. The space inside was well cleared and was planted with plantain shoots each surrounded by little protecting sticks. Inside this rail were three huts of the same construction as those described by the "Galathea" Expedition and as those we had seen on our way up but rather bigger. These were raised 3' from the ground, 6' × 6'. The posts were very thin bullies: the roof consisted of back-sheets and a few rattan leaves. Only one house of three was provided with a bark cooking-

pot, but in this it was fixed at the southern end and was on the platform, and not on the ground as was the first one I mentioned. The pot consisted of three sheets of bark, one stuck inside and over the others like roofing: it had been exposed to fire.

We had to climb over some fallen trees, and when we came up to the village we found inside "Koal" the man I had met in October, and an old man suffering from hydrocele. "Koal" recognized me and promised to bring our luggage, and in a little while we were with our guides in sole possession of a Shombeng village. The inhabitants had evidently left on our approach, but they had had time to take away all their valuables, for they only offered us shelter, which, however, was an important point.

Colonel Cadell took possession of one house and I of another. The difference in size was not very great, but it was quite balanced by the cooking pot at the one end that shortened it considerably, so that only two small persons could find shelter in it. After a while our luggage was brought up. Koal and the old hydrocele, however, disappeared again after having brought our guides a few Gunyas. After a while we were informed that the Shombengs were afraid of us and would not come in, so we had to put pressure on. Our guides had no food, and when we declared that we would not leave till we had made friends with the inland tribe they began to bestir themselves. They went off after Koal and after a long explanation he at last promised to bring in some of his friends, saying that they would be with us at 2 P. M., pointing to the sun. We waited patiently till 2 and impatiently after that time, and when it was nearly dark we were beginning to fear that our visit had been all in vain, even our guides were in a bad humour, when we were cheered up by the arrival of a party of this curious people, headed by Koal. We remained seated where we were and took no notice of them till they had come inside the enclosure and stood round us. We then gave them peace-offerings of strings of little glass beads, and in a very short time we were on the best of terms. They submitted to our examining them and to our taking locks of their hair. These little glass beads are the only valuable property they care for and ours were considered very nice. Money they did not even know. Seated near a smoking fire that nearly blinded us, and delighted at our success, we proceeded to examine them, and, to make sure of the accuracy of our notes, they were drawn up by Colonel Cadell on the spot and contain what we agreed about. I give our notes verbatim. The first man mentioned I will refer to later on.

"Koal, Mr. de R's old friend with the bushy hair has already been described.

"No. 1, Alles—height 5' 3", chest 36", age about 30 or 35—hair thin, straight, black, eyes black—well built, but rather bony—parts



loosely tied, as if not often covered at all—pubes sparse—toes spread out—small sparse moustache—a few hairs in beard—teeth discolored but not enlarged—head appears as if flattened behind but this is said not to be customary with Shombengs—color slightly, very slightly, lighter than that of the Coast-people—ears bored, and pith,  $\frac{1}{2}$ " diam., through one of them. Double string of white seeds from over left shoulder and below right arm—on both arms strings of dark and light fibre intertwined.

"No. 2, Towkow—height 5' 2 $\frac{1}{2}$ ", chest 36"—age about 16 or 18—hair straight, plentiful, cut square over eyebrows—black-brown eyes, Mongolian shape—high forehead—face long, narrow—nose straight with slight bend—mouth small—teeth slightly discolored—a pleasant face altogether—parts well developed and scarcely concealed—necklace of white seeds—string on arm as No. 1—right ear bored but not enlarged—left with bamboo and leaves through lobes—small strip of red chintz round head.

"No. 3, Ahéan—son of No. 4—age 16—height 4' 11 $\frac{1}{4}$ ", chest 35"—hair straight, long, thin, black—eyes well defined, Mongolian type, but not so much as No. 2—prominent cheek-bones—upper lip thin but protruding—a few single hairs on chin—both ears pierced—a round piece of stick pointed (1" diameter) through one lobe and pith through other—parts small and loosely tied—a well made youth.

"No. 4, Taug—age about 40—height 5' 3"—chest 36"—hair straight, thin, tinged with grey—moustache almost invisible and no other hair on face—both ears pierced—through right, pith  $\frac{1}{2}$ " diameter, through left, round piece of stick  $\frac{3}{4}$ " diam. as No. 3—teeth discolored, but not enlarged—a well built man—parts small, loosely tied—round neck necklace of white and red seed with fringe of pieces of plantain leaf curled—some neatly woven straw in his hand.

"No. 5, Kéal, a priest—age about 30—height 5' 4 $\frac{1}{4}$ ", chest 36 $\frac{1}{4}$ "—eyes small, brown—hair straight, long, black—slight trace of moustache—ears bored, rolled leaf in one—two front upper teeth  $\frac{5}{8}$ " long, but no foreign substance on them—necklace of small beads—band of white bark round head."

The following was added next morning:

"No. 6, an old man with hydrocele }  
"No. 7, ditto ditto } whom we did not describe.

"No. 8, Khoál, wife of Koal—about 25—height 5' 1"—chest 31 $\frac{1}{4}$ "—hair straight, coarse, black with brownish tint, parted over eyes, narrow band of white bark round it—both ears pierced, one with a hollow bamboo through it, the other with a stick—teeth discolored but not enlarged—necklace of several rows of small beads—striped red and white cloth round loins, and a loose piece of blue cloth over shoulder or anywhere where

fancy pleased. She brought with her a boy of about 6, a nice intelligent-looking lad, and, afterwards, on her back and hanging to her neck, a small boy of about 2.—T. CADELL."

It will be seen from the above notes that the people is a comparatively big race with straight hair and Mongolian twisted eyes, and in them Col. Cadell agrees with me that every trace of Papuan or Negrito features is quite absent.

There remains, however, Koal the man I met in October. I described him in the paper of Jan. 1881 thus:

"One look at him sufficed to assure me that I had now come across a specimen of a curly-haired race, Papuan or Negrito. His hair was bushy and with rather a bend, and was very abundant. It covered the whole surface of his head and was not, like the hair of an Andaman Negrito, of the Papuan of New Guinea or of the Negro, found in tufts or patches. It had, however, the Papuan quality of being long, longer than the hair of the Andamanese ever is. The hair was, or appeared to be, brownish, interspersed with white, very coarse and stiff, and gave an exaggerated appearance of size to his head....His face was pleasant, especially when smiling, his forehead was high, his eyes were black, his nose well formed and arched, his upper lip was remarkably prominent from the base, his underlip small, his teeth were black but of natural size. ...His colour was copper-brown and a shade fairer than our Great Nicobar and Camorta guides. His complexion did not at all remind me of the deep shining black of the Andaman Negrito....He had his private parts tied up, but in such a loose way that it was evident that the Coast-people are right when they assert that the male Shom-Bengs go quite naked in their own haunts." This description I still maintain is correct. Colonel Cadell states that he noticed that he was quite different from the others and that, if searching for Papuan or Negrito elements, he would most certainly have made the mistake of taking him to be such, if he had seen him alone.

He is quite a phenomenon, but, I think, a *lusus naturæ*, for we saw his children and neither of them had the slightest curl in their hair nor any feature recalling the Papuan. All the others agreed in appearance. They were all scanty-haired on the face and on the body, and we only saw one man (not described in the list) who had a fairly well developed moustache. They seemed of mixed Malay-Mongolian origin, and they were doubtlessly a different race from the Coast-people, being slightly fairer and with lighter hair and darker eyes than they, but yet the difference is not so great that it would be impossible to meet a Shombeng among the Coast-people and not notice the difference.

They are great cultivators and had cleared big tracts of land but in a very slovenly manner. No attempt had been made to burn the fallen trees

nor any to get rid of the branches. They do, however, cultivate deeply, for I got in 1876 from the Shombeng in Ganges harbour a very big yam and some Gunya which must have been carefully grown. One great clearing Col. Cadell and I went over. It was fenced all round, evidently to keep out pigs. The clearing stretched over a small valley from hill top to hill top. The only road across the confused masses of débris lying on the ground was a continual bridge of fallen logs, which seemed well suited to Shombeng feet but less so to boots, and we found it rather difficult to cross. On the top of the other hill we came to two huts. The one was circular and 8½' from the ground. They were very dilapidated and did not look fit to withstand the heavy storms of the S. W. Monsoon. Col. Cadell went alone with Koal down a precipice with just space here and there for a naked Shombeng foot and he saw there another big clearing. To me it appeared as if the Shombengs with these clearings were making preparations for next year's operations, and that they leave any occupied piece of land when the virgin-soil fertility is exhausted. As the only domestic animal they keep is the pig, they have no means of manuring the exhausted soil, and they would therefore have to go to new grounds. The little villages near the stream below the hills seemed to me intended for the rainy season as they were in sheltered places and were newly made. After the meeting with Koal the first time, I thought that my idea that the Shombengs were not a Papuan or Negrito race was erroneous. I therefore made haste to publish a report of my meeting and of my doubts. Now that I have met the Shombengs in greater numbers, I beg to revert to my old theory that they are a race different from the Coast-people, without any Papuan or Negrito blood, and I beg again to suggest that they may be the same race originally as the inhabitants of the little Island of Schowra, who live by cultivation whereas all the islanders around them are keen fishermen. They are *also* supposed to be fairer than the Coast-people and have a Mongolian cast about their eyes.

I would have preferred that the report of our visit to the Shombeng country had come from the pen of Colonel Cadell, who would have given a better description of all we saw and heard, especially as the Expedition was originated and carried through by him, but he has suggested that I should write it.

Mr. BALL said: "The proverbial difficulty of proving a negative is well illustrated by Mr. de Roepstorff's paper, which is a further contribution on the subject of the inland inhabitants of the Great Nicobar. His researches do not disprove the supposed existence of a race in the interior of that Island having Negrito affinities; though it must be confessed that they render it less probable than it was thought to be before.

"A thorough scientific exploration of the islands included in the Andaman and Nicobar groups is a great desideratum, not only for the purpose of setting at rest such Anthropological questions, but also in order to completely elucidate the Zoology and Geology.

"With reference to the latter there are two questions of considerable economic importance which have yet to be determined. The first of these is whether coal in workable quantities exists. Hitherto, such coal as has been found in the Andamans and Nicobars only occurs in small nests of limited extent and not in regular seams. The rocks of the Andamans are, so far as is known, of older Tertiary (Eocene) and perhaps partly Cretaceous ages: they are probably closely allied to some of the groups which include workable coal in upper Burma and Assam. In the Nicobars there are rocks of the same age and together with them some which are younger, probably Miocene. There are believed to be distinct points of resemblance between the former and the coal-bearing rocks of Sumatra, Borneo and Java. So that, arguing from analogy, there appear to be grounds for believing that a useful discovery of coal may be made in these islands.

"Some years ago I appended to a paper on the Geology of Port Blair, which was printed in the Journal,\* three allusions, two distinct, and one less clear, to a rumour that mercury has been found in the Andamans. The mode of occurrence and the age of the rocks with which mercury occurs in different parts of the world vary a good deal; for present purposes it is only necessary to refer to California where the deposits afford two-thirds of the mercury of commerce. These deposits occur in altered Cretaceous rocks with which serpentine is associated, the ore of mercury, cinnabar, being sometimes found in the serpentine itself. It is believed, as above stated, that some of the rocks in the Andamans will prove to be of Cretaceous age, and it is an ascertained fact that serpentine occurs in some abundance associated with them. Now it is known, all the world over, that similar associations of rocks are often accompanied by the occurrence of similar minerals. It seems therefore to be quite justifiable to express a hope that research may prove the existence of mercury in these islands. It is needless to remark that owing to its high value such a discovery would be of great importance.

"It is now ten years since I directed the attention of some of the officials in the Andamans to the possibility of such a discovery being made and Mr. Homfray, then protector of the Andamanese, shewed them some metallic mercury, but they appeared to be unacquainted with it and nothing was elicited. A much more likely way of being successful would be to make search for cinnabar which is the common ore of mercury.

"The red pigment commonly used by the Andamanese was some years ago analyzed by Dr. Waldie and found to consist of red oxide of iron.

\* Vol. XXXIX, 1870, p. 239.

This need not be taken as proving that no source of cinnabar was available to them, because they may have found by experience that the use of the latter was injurious to their health.

"An expedition to explore these islands should be thoroughly well officered and equipped. Speaking from personal experience, I can say that the risk of fever is very great, and those who remain on shore at night will have to take every precaution to avoid its attacks; but, as I have endeavoured to show, there are reasons, both scientific and practical, which encourage the belief that such an exploration would prove fruitful in good results."

4. *Note on a photograph of a Buddhist sculpture found at Bulandshahr.*—By F. S. GROWSE, C. I. E.

The Buddhist sculpture, shown in the accompanying photograph, was discovered a few days ago at Bulandshahr, in the garden of a native gentleman, Munshi Gopál Rái, close to the Id-gah, between the city and the civil station. It had originally been dug up some 20 years previously in the old Khera known as the Moti Bazar, which is now being levelled. It is of interest as being, so far as I know, the only unquestionable proof that has yet come to light of the ancient prevalence of Buddhism in this neighbourhood. The sculptured pillars that I found in the town of Bulandshahr, and of which a notice and illustration were given in the Society's Journal for 1879, may have belonged either to a Buddhist or to a Brahmanical temple; it is impossible to say which, the style of architecture affected by both being essentially the same and differing chiefly in ground plan. The stone, in which the sculpture is cut, is a square block measuring in its mutilated state 1 foot  $4\frac{1}{2}$  inches either way, the material being a black slate, not the *sang-músa* or black marble of Jaypur. The principal figure represents the Buddha, enveloped in a thin robe reaching to the wrists and ankles and falling over the body in a succession of narrow folds. His arms are slightly raised in front of his breast and the thumb and fore-finger of his left hand are joined at the tips, while with his right hand he touches its middle finger, as if summing up the points of an argument. On either side of his throne is a rampant hippogriff, with its back to the sage and rearing its head over a devotee seated in an attitude of prayer. The throne is supported on two recumbent lions, flanked by Hindu caryatides with impossibly distorted limbs as usual; and at the base again are other devotees kneeling on either side of the footstool, the front of which is carved with the mystic wheel between two couchant deer. The upper part of the stone has been broken off, carrying with it the head of the principal figure, but what remains is in good preservation and has been well executed. On a ledge in a line with

the feet is an inscription in characters apparently of the 9th or 10th century, of which I sent a rubbing to Dr. Hoernle, who reads it as follows:

*Ye dharmmā hetu-prabhavā hetus teshān tathagato hyavadat teshām cha yo nirodha. evam-vādi mahāsramanah.*

This would be in English "All things that proceed from a cause, says the Tathāgata, their cause is identical with their destruction; such is the dictum of the great philosopher."\* If this is the form of words that is always used, it is curious that a popular symbol of faith should have been framed with so much tautology in so short a compass.

5. *Note on some curiosities found at Bulandshahr.*—By F. S. GROWSE, C. I. E.

In the course of some excavations in the plateau of high ground immediately outside the town of Bulandshahr, mentioned in the previous note under its popular name of the Moti Bazar, I have come upon the remains of an old local manufacture, of which I send six specimens for the inspection of the Society. They may be described as earthenware flasks or vases, but the purpose for which they were intended is by no means obvious, and I should be glad of suggestions. They are all alike in general shape, being pointed at the bottom like a Roman amphora and with a very small orifice for the mouth; but they vary very much in the patterns with which they have been ornamented, and are of different size, weight and thickness. Some have apparently been squeezed out of shape, before the material of which they are made had had time to dry. The spot where they were found is evidently that where they were baked, as the number that have been dug up entire amounts to several scores, besides a multitude of broken pieces, all mixed in a deep deposit of ashes and the other refuse of a potter's kiln.

At the same level have also been uncovered many fragments of wall and pavement, constructed of large and well-burnt bricks measuring as much as 1 ft. 7 in. in length by 11 inches in breadth and 3 in. in thickness. Most of these bricks are marked on one side with two lines drawn by the workman's fingers in the damp clay, and they are, I should say, of great antiquity. At first, however, I did not suppose that the flasks were at all of the same age. The site might have been originally occupied by a fort and then deserted for centuries before the potters came and set up their kilns upon it, making use—for their houses—of any old building materials that they happened to light upon. The traditional name by which the piece of ground is popularly known is, as I have said, the

\* [Or rather: "all things that proceed from a cause, their cause as well as their destruction the Tathāgata has declared; such is the dictum of the great philosopher." Ed.]

Moti Bazar, and there is much vague talk of coins and solid bars of silver having been discovered there in former years. It is bounded on one side by a deep ravine, which I am now filling up in order to convert the entire area into a public garden, which will be called the Moti Bâgh, thereby perpetuating the old tradition.

Most natives who have seen the flasks think they were meant to hold either gunpowder or oil, which is what the shape suggests; but the material, on account of its weight, seems unsuitable for such a purpose, if the flask was to be carried about on the person, while the pointed bottom makes it awkward for storing. The idea has also been hazarded that they were meant to be filled with gunpowder and then exploded as a kind of fire-works; but, if this were their object, there would scarcely have been so much trouble spent on their ornamentation. A third theory, which has found much favour on the spot, but which at first I was inclined to reject as altogether untenable, is that they were intended to form a balustrade for a balcony or the roof of a house. Perhaps after all this is not so very far wrong; being found at the same level as the Buddha and the bricks and also a seal apparently of the 5th century A. D., an impression of which will be exhibited at the next meeting of the Society, the presumption is that they are of about the same date, and they may be the finials of miniature Buddhist stupas.

A specimen of the bricks, of which upwards of a thousand have been found, is sent also with the vases.

### LIBRARY.

The following additions have been made to the Library since the meeting held in May last.

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Distant, W. L.—Description of a new Longicorn Beetle from Java. Carter, H. J.—On the Kunker Formation of the Alluvium in India compared with the Flint Formation in the chalk of England. Wood-Mason, J.—Description of *Parantirrhæa Marshalli*, the Type of a new Genus and Species of Rhopalocerus Lepidoptera from South India. A History of the Birds of Ceylon, by Capt. W. V. Legge.

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No. 17. *Faye, M.*—Sur une question de Métrologie ancienne; origine du mile anglais.

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No. 18. *Véloin, Ch.*—L'Algérie et la Pays des Kroumirs. *Rochas, de.*—Le Traité des gaz, par Héron d'Alexandrie.

No. 19. *Verneuil.*—Du paludisme considéré au point de vue chirurgical.

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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
FOR JULY, 1881.

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The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 6th July 1881, at 9.15 P. M.

C. H. TAWNEY, Esq., M. A., Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Home, Revenue and Agricultural Department,—Shering's Hindu Tribes and Castes, vol. III.
2. From the authors,—(1) *Die Culturländer des alten America ; Die Voelker des oestlichen Asien : Studien und Reisen*, vols. I, II and IV ; *Beiträge zur Ethnologie und darauf begründete Studien ; Mexico : Vortrag*, gehalten in der Sing-Academie am 18 Januar 1868 ; and *Remarks on the Indo-Chinese Alphabets*, by Dr. A. Bastian, (2) Report on accessions to our knowledge of the Chiroptera during the past two years (1878-80) ; Report on the Geographical Distribution of the Chiroptera ; and *Sur quelques espèces de Chiroptères provenant d'une collection faite en Algérie par M. Fernand Lataste*, by Dr. G. E. Dobson, (3) *Bibliographie Générale de l'Astronomie*, vol. II, pt. 2, by J. C. Houzeau and A. Lancaster, (4) *Govinda Gitika* by Raja Mahendralala Khan.
3. From the Panjab Government,—Glossary of the Multani Language compared with the Panjabi and Sindhi, by E. O'Brien.
4. From the Geological Society of London,—Catalogue of the Library of the Geological Society of London.
5. From A. W. Franks, Esq.,—List of Drawings from the Amravati Tope, Southern India, made for Col. C. Mackenzie, 1816-19, and preserved in the Library of the India Office.
6. From the Political Agent and Superintendent, Charkharee,—twelve copper coins.

The following Gentleman, duly proposed and seconded at the last meeting, was elected an Ordinary Member of the Society :

Prince Firukh Shah.

The following Gentleman is a candidate for election at the next meeting :

H. C. Barstow, Esq., C. S., Magistrate and Collector, Cawnpore, proposed by H. Rivett-Carnac, Esq., C. S., seconded by Dr. G. Thibaut.

The COUNCIL announced that the report of the Auditors of the Society's Accounts had been received, and that the suggestion of the Auditors, that the stock of Books be not entered as an Asset, had been approved.

Dr. HOERNLE exhibited a wax impression of a curious old seal of baked clay, found by Mr. Growse at Bulandshahr, and read the following note on the same and on the vases exhibited at the last meeting by Mr. Growse :

"My excavations at the Moti Bagh are still in progress and this morning the workmen turned up a curious old seal of baked clay, of which I enclose an impression. The oval is divided by two parallel lines into two equal compartments, in the upper of which are two devices, the one a conch shell, the other—which is raised on a little stand—looks like a wing and may possibly be intended for a *chakrad*. In the lower compartment is a name in early characters, probably of about the 5th century A. D., which I read as Sattila.

I have no doubt now that the vases exhibited at the last meeting are the finials of miniature Buddhist stupas, such as are not unfrequently found in old *kheras*. At first I looked upon them as too modern to allow of this suggestion holding good ; but this discovery, on the same spot and at no greater depth, first of a Buddhist sculpture with an inscription in characters of about the 8th century A. D., and now of this seal which may be some 2 or 3 centuries older still, renders it probable that they too may be referred to a period equally remote, when Buddhism was the predominant religion of the neighbourhood."

Mr. BALL exhibited an ancient stone implement made of magnetic iron ore, and said that he was indebted for it to Mr. W. G. Olphert, to whom it had been sent simply as a specimen of iron ore. Its history had not yet been fully ascertained but it was believed to have been obtained somewhere in the Narbada valley.

The material, magnetic oxide of iron, containing perhaps from 60 to 70 per cent. of iron, though admirably suited on account of its weight and toughness for making into a chipped implement, does not appear to have been often so employed. The present is in fact the only known specimen.

It might be suggested by some that the use of this material was a step in the direction of the substitution of iron for stone, but it would be difficult to prove such a proposition.

The following papers were read—

1. *The Revenues of the Mughal Empire in India.*—By EDWARD THOMAS, F. R. S., late Bengal C. S.

(Abstract.)

In Volume XLIX of the Journal of the Society a paper was published by Mr. C. J. Rodgers on the "Copper Coins of Akbar," in which he entered into some speculations on the amount of the State Revenue of that monarch, based upon new interpretations of the legends of his coins, and considerably differing from the calculations of Mr. E. Thomas, in his "Revenue resources of the Mughal Empire." The present paper is a brief reply by Mr. Thomas. After mentioning that his calculations have been accepted as correct by Dr. Hunter, Mr. C. Markham and others, he shows that one of Mr. Rodgers' main arguments, based on his reading the word *dīm* on Coin No. 4, falls to the ground, inasmuch as the word is not *dīm*, but *damrā* (i. e., a double *damri*). He similarly shows that Mr. Rodgers' second main argument is based on a confusion of the terms *tankah* and *ṭānka*.

This paper will be published in full in the Journal, Pt. I, No. 2, for 1881.

2. *Description of a new species of Butterfly belonging to the genus Dodona.*—By LIONEL DE NICEVILLE.

[Received June 24th; Read July 6th, 1881.]

*DODONA LONGICAUDATA*, n. sp.

♂ **UPPERSIDE** deep shining brown. *Fore wing* crossed before the middle by a broad white band which does not quite reach the costa, being narrowest at that point and divided by the nervules into two small spots. This band has its inner margin straight, the outer margin evenly convex. A submarginal series of six white spots placed irregularly. An indistinct marginal series of linear spots. *Hind wing* with the white band of the fore wing continued in a wedge-shaped figure across the disc of the wing, ending in a point just below the first submedian nervure. Abdominal

area paler, with an indistinct white band from the base, and another short transverse one above the anal angle. Incomplete submarginal and marginal bands of white linear spots. Anal lobe black, encircled by a white line and thickly irrorated with white scales. *Tus!* long, black; tip and cilia white.

**UNDERSIDE** rich bright brown, crossed by several silvery-white bands. *Fore wing* with narrow basal and subbasal bands, then a broad median band coincident with the band above but not reaching the costa; a short narrow costal band; then a very irregular broad band which is broken up into spots on the inner side below its middle; and lastly a marginal series of seven spots, the two upper ones rounded and out of line, the rest increasing, linear. The ground-colour near the outer angle becoming darker and almost forming two dark brown spots. *Hind wing* with the two basal and broad median bands as in the fore wing, but all meeting above the anal angle, at which point they are joined by two other white bands traversing the abdominal area. There is also a fourth band from the costa, short, narrow, submarginal, reaching the discoidal nervale, between which and the broad median band there is another narrow white line not reaching the costa, in continuation of which is an orange fascia terminating on the abdominal margin in a black linear spot, and bearing two black rounded spots at its upper extremity. Submarginal and marginal white lines. Anal lobe jet-black, surmounted by a black, white-irrorated space ending in a black spot on the abdominal margin, which space is divided from the lobe by a white line.

**CILIA** of *fore wing* brown, except a small portion near the inner angle; of the *hind wing*, alternately brown and white.

**BODY** above deep brown, with a somewhat rufous collar; beneath, white, with a black median abdominal line.

**LEGS.** The atrophied fore legs are pure white, the two posterior pairs have their tibiae and tarsi ocraceous.

**ANTENNAE** black, annulated with white.

A single specimen taken by the late Mr. J. P. Cock near Shillong, Assam, in November.

This species seems nearest allied to *Dodona deodata*, Hewitson, from Moulmein, figured in Plate I of Moore's "Desc. new Indian Lep. from Coll. Atkinson," Part I. 1879, from which species it may readily be distinguished on the upperside in having only one median white band, being in fact altogether a much darker insect. *D. deodata* is apparently tailless, or the tails are rudimentary.

This is only the eighth species of this very interesting and compact little genus (all of which occur in India) as yet described. It is remark-

1881.] O. Feistmantel—*Sketch of the history of the Gondwana fossils.* 123

able for the length of its tails, which are quite twice as long as those of *D. egean*, Doubl. Hew., which species has them the next longest of the genus. It will be figured in the forthcoming work on 'The Butterflies of India, Burmah and Ceylon,' by Captain Marshall and myself.

3. *Sketch of the history of the fossils of the Indian Gondwana system.*—By O. FEISTMANTEL, M. D., *Palaeontologist, Geological Survey of India.*

(Abstract.)

The fossils of the Indian Gondwana system, the most important series of sedimentary rocks in Peninsular India, have been now under examination for several years, and various memoirs have been published containing descriptions and illustrations of the vegetable and animal remains of this important rock-system. These fossils have been, however, hitherto treated of in a stratigraphical order only, according to the groups from which they were procured. A general review of the fossils in a biological order was hitherto wanting, and as only lately Mr. R. Lydekker gave a sketch of the history of the fossil Vertebrata in India in the Journal of the Asiatic Society of Bengal, the author thought it would prove of some use to write a similar sketch of the Gondwana fossils for publication in the same Journal.

A general review of the literature referring to Gondwana fossils is given, also a review of the various groups of the system with regard to the occurrence of fossils in them; then follows the enumeration of the fossils (vegetable and animal) in a systematical (biological) order, with indication of their geological and geographical distribution, and a few general remarks on the peculiarities of the fossils of this system conclude the paper.

This paper will be published in full in the Journal, Pt. II, No. 3, for 1881.

4. *New and little known Mollusca belonging to the Indo-Malayan Fauna.*—By GEOFFREY NEVILL, C. M. Z. S.

(Abstract.)

This paper contains complete descriptions of certain species of Mollusca which were only briefly described in the author's 'Hand-list.'

The plates include figures of most of the shells previously described by Mr. Nevill, but of which no illustrations have hitherto been published: thus one of the plates represents the brackish-water shells described in the Journal, Pt. II, No. 8, 1880.

In addition to the above there are descriptions of many new and important species lately discovered by Surgeon-Major R. Hungerford at



the Philippines, in Formosa, &c., as well as of some new *Rissoina* which are being figured by Dr. Weinkauff for the forthcoming monograph in the new edition of the well known standard work, the 'Conchylica Cabinet.'

A new species of the brackish-water genus *Fairbankia*, which was discovered by Mr. F. Fedden 10 feet below the surface in Káthiáwár, is also described.

In his preface Mr. Nevill alludes to the unmerited oblivion into which some upper cretaceous *Helicoidæ* described by Dr. Stoliczka appear to have fallen. The author also makes some observations on the distribution and probable origin of the land Mollusca of the Madagascar region in connection with some remarks by Mr. A. R. Wallace in his recent work 'Island Life.'

This paper will be published in the Journal, Part II, No. 3, for 1891.

MR. FEDDEN said:—I may mention that the Rissoid shell from the Rann, described in Mr. Nevill's paper, and placed by him somewhat doubtfully in the genus *Fairbankia*, was obtained, together with about a dozen other semi-fossil shells, from a clay bed ten feet below the surface of the "Little Rann" (as it is called, on the north side of Káthiáwár)—the bed from which the brine is obtained at the salt works near Kúra (or Kúda) in the Dhrangadra State. There is first the surface soil, an earthy clay, then a dark plastic clay, thirdly a brown clunch, a close stiff clay, and fourthly the fossiliferous clay, which is dark bluish and plastic, highly saline and gypseous (crystals of gypsum). The base was not reached in the brine pits. From this lower clay I obtained by washing a number of small shells, among which are the following:—

*Pirenella*, probably two species of this prettily marked shell, the most numerous.

Along with these a few specimens of *Tympanotomus fluviatilis*, (one of the *Cerithidæ*), now common on the coast near the mouths of streams.

*Assiminea*, a sub-genus of *Rissoa*, and one or two other Rissoids.

A pretty little *Melampus*, probably a variety of *M. striatus*.

Then there are apparently two species of the minute shell *Stenothyra*; one species is *minima*, the other I should call *major*, if new.

There is also a little shell that Mr. Nevill thinks may be a new species of the rare genus *Theora*, and of bivalves a *Glaucomya* (*Glaucome*), near, if not identical with, the Chinese species (*Chinensis*), a common borer in tidal mud banks, and one or two other shells not yet examined.

It will be seen that the collection, though small, is of some interest to the Conchologist as well as the Geologist. The general *facies* presents a mingling of brackish-water with marine forms, and, considering that the locality is situated 65 miles from the present head of the Gulf of

Kachh, tends strongly to confirm the supposition that the Rann was an annex of the sea not very long ago, but was given up, and, on being evacuated, became silted up.

5. *Additional remarks on the Identification of Ancient Diamond Mines in India.*—By V. BALL, M. A., F. G. S.

(Abstract.)

In this paper the author finally adopts the view that the mine called Raolconda by Tavernier is identical with the modern Ramulkota. In his previous paper he named this as the alternative in the event of Rawduconda not being the place. With the aid of Mr. King the localities mentioned by Tavernier as intervening between Golconda and Raolconda have been fully identified with places between Golconda and Ramulkota where there are still traces of former extensive mines.

One consequence of this is that the measure of distance called the *gos* by Tavernier must have been 8 miles, and the league of Tavernier was not the French league, but a paraphrase for the elastic *cos*.

The present paper confirms the previous identifications as to other mines and includes information illustrative of several points in the original communication.

This paper will be published in the Journal, Pt. II, No. 3, for 1881.

The following communication has been received :

"The Electric Telegraph and Natural History" by W. MacGregor.

## LIBRARY.

The following additions have been made to the Library since the meeting held in June last.

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- Annual Report of the Police Administration of the Town of Calcutta and its Suburbs for the year 1880. Fcp., Calcutta, 1881.
- Annual Report on the Insane Asylums in Bengal for the year 1880. Fcp., Calcutta, 1881.
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BHANDARKAR, R. G. Report on Sanskrit MSS. Fcp., Bombay, 1880.

## BOMBAY GOVERNMENT.

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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
FOR AUGUST, 1881.

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The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 3rd August 1871, at 9-15 P. M.

C. H. TAWNEY, Esq., Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Bengal Government,—(1) General Rules and Circular Orders of the High Court of Judicature at Fort William in Bengal (Appellate Side; Civil and Criminal), (2) Archæological Survey Reports, Vols. X and XI.

2. From the Bombay Government,—Archæological Survey of Western India, Reports, No. 10, by J. Burgess and Bhagawanlal Indraji.

3. From the German Oriental Society,—(1) *Qolasta*, by Dr. J. Euting, (2) *Epistolæ Novi Testamenti Coptice*, by P. Boetticher, (3) *Indische Studien*, Vol. X, Nos. 1, 2 and 3.

4. From the Institution of Mechanical Engineers,—Library Catalogue, May 1881.

5. From the Authors,—*Sanskrit Wörterbuch in kürzerer Fassung*, Pt. II, 2, by O. Böhtlingk; *The Precedents of Princess Thoodamma Tsari*; *Prince Weezaya*, a Burmese drama, translated by Chr. J. Bandow; *The Revenue Resources of the Mughal Empire in India*, from A. D. 1593 to A. D. 1707, by E. Thomas.

6. From K. Zoologisch Genootschap *Natura Artis Magistra*,—*Catalogus der Bibliotheek*.

7. From the Home Department,—(1) Archæological Survey of India, Reports, Vols. X and XI, (2) *On the Manufacture of Iron and the Future of the Charcoal Iron Industry in India*, (3) *Samaveda Sanhita*, Pt. 2.

8. From the Smithsonian Institution,—*Annual Report for the year 1879*.



9. From the Editing Committee,—The Norwegian North Atlantic Expedition ;—Zoology, Fishes ; and Chemistry.

10. From F. C. Black, Esq.,—A stone slab bearing an inscription, found among the ruins of the old fort of Deogarh.

The following Gentleman, duly proposed and seconded at the last meeting, was balloted for and elected an Ordinary Member :

H. C. Barstow, Esq., C. S.

The following Gentleman is a candidate for ballot at the next meeting :

H. M. Percival, Esq., Professor, Presidency College, proposed by C. H. Tawney, Esq., seconded by A. W. Croft, Esq.

The SECRETARY reported that Dr. G. E. Dobson and Babus Dijendra-nath Tagore and Jogesh Chunder Dutt had intimated their desire to withdraw from the Society.

The SECRETARY reported that the following coins had been acquired under the Treasure Trove Act :

From the Deputy Commissioner of Bahraich,—16 copper coins of Sikander Lodi.

Dr. R. MITRA exhibited a MS. of the Bhaṭṭi Kāvya in Bengali characters, 478 years old, and read the following note regarding it.

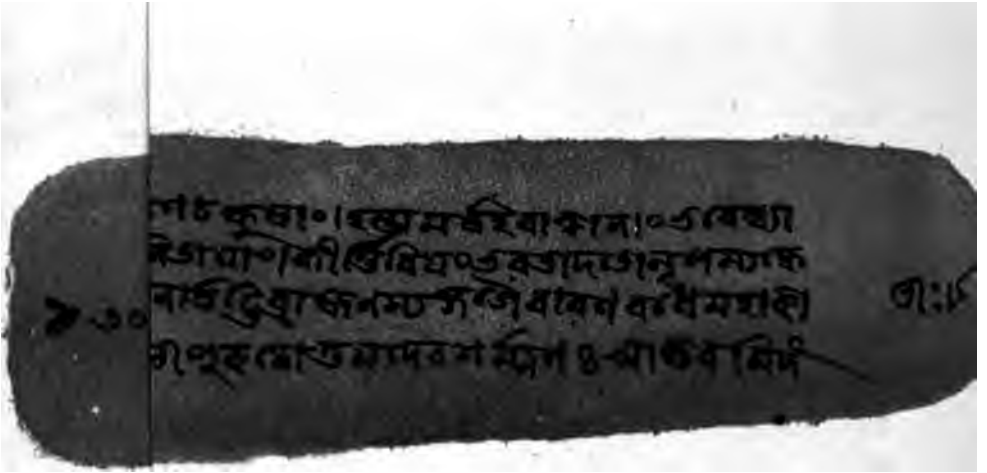
*Note on a Manuscript of the Bhaṭṭi Kāvya.*—By DR. R. MITRA.

I have lately received from my travelling Paṇḍit a MS. of the Bhaṭṭi Kāvya, bearing date Śaka 1326. It is written on yellow paper of Indian manufacture, and comprises 130 folia, each folium measuring  $13\frac{1}{2} \times 2\frac{1}{2}$  inches. The writing is in well-formed Bengali letters, differing in no respect from the Bengali writing by Paṇḍits of the last century. The leaves are all stained with water marks, and the colour of the yellow orpiment with which they are dyed is very much faded, bearing unmistakable testimony to the age of the MS. The number of lines on each page is 6, except on a few pages where only 5 lines are written. The colour of the ink is well preserved, except in the marginal notes written at different times by different persons. The name of the scribe is Puru-shottama Deva Śarmā. A facsimile of the last page is given in plate II.

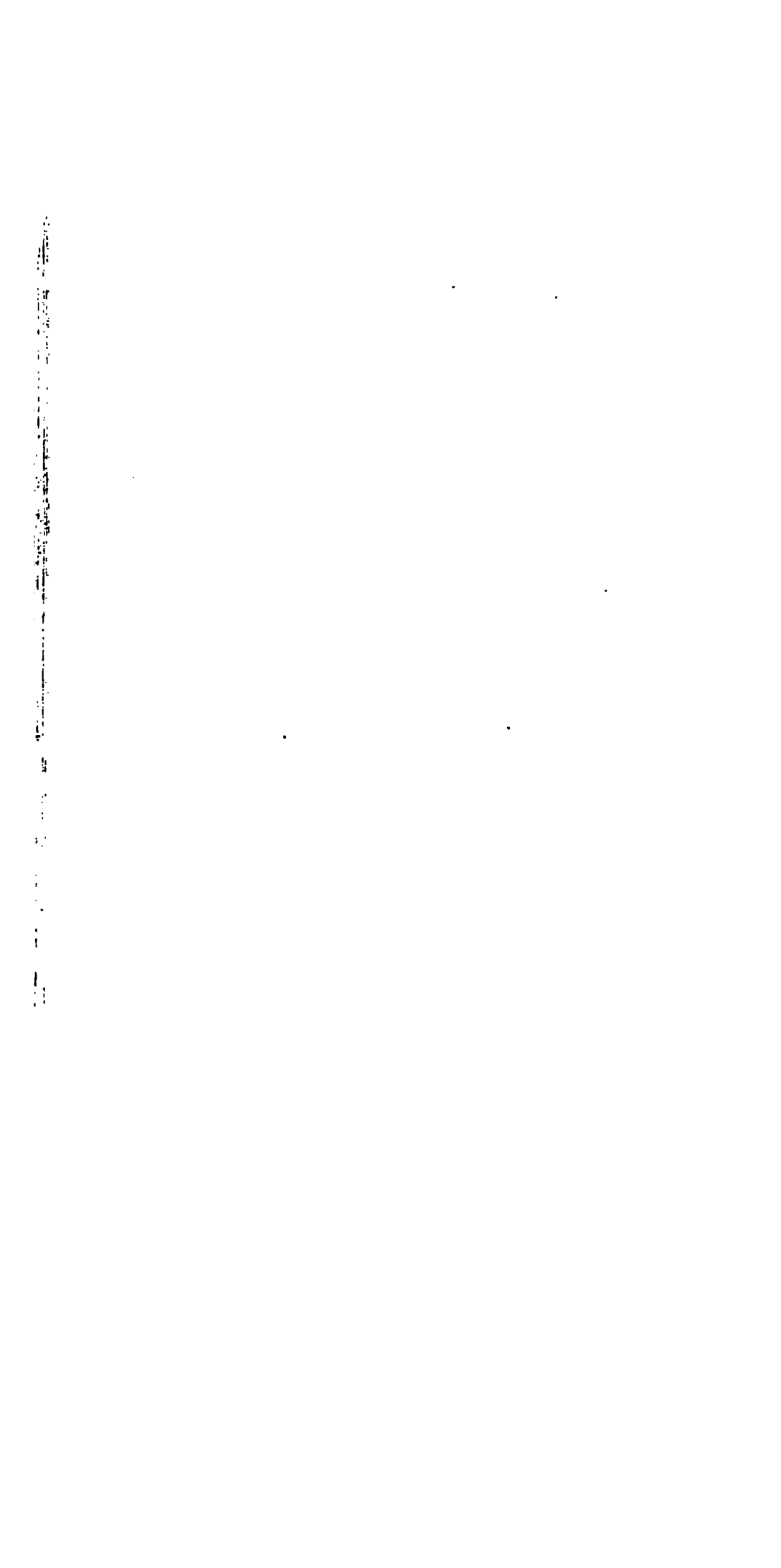
The work is a standard text-book on grammar in Indian schools, and has already been printed several times, but the codex under notice is the oldest that has yet been discovered, and is worthy of notice from the fact of its being remarkably correct and containing some new readings.

There are two other circumstances in connexion with the codex which are worthy of note. The first is the name of the work, and the second, the

PLATE II



YA, DATED ŚAKA 1326.



name of its author. In all the modern MSS. of the work that I have seen the name of the book always appears to be *Bhaṭṭi*; and the six commentators whose works are accessible to me in Calcutta either call it *Bhaṭṭi*, or "an epic (*Mahākāvya*) on the history of Rāma." Nowhere is any specific name given for the work. European orientalists, commenting on the work, have invariably used the name *Bhaṭṭi*, without any doubt or qualification. The MS. under notice, however, gives the specific name *Rāvaṇa-badha* or "the Destruction of Rāvaṇa," and in the colophon of the Serampur edition the same name is to be met with, though it is not given on the title-page. The disuse of the specific name can be attributed to one of two causes; either the author left an only work to posterity, and therefore his name was held enough to indicate his work, as in the cases of *Sisupāla-badha* and the *Kirātārjunīya*, which are best known by the names of their authors, Māgha and Bhāravi; or to the fact of there having been another work of the same name of great renown, the *Rāvaṇabadha* of Pravarasena, and the necessity thence arising for a mark of distinction.

As regards the name of the author, commentators are very much divided in opinion. The MS. under notice makes *Bhaṭṭi*, son of *Srīdhara Svāmī*, to be the author. Its words are इति बहुभीवास्तथ्यौधरखामिन्दुनोर्भट्टिनाष्टव्यस्य छनो रावणवधे महाकाव्ये निरुक्तकाण्डे सटप्रदर्शने नाम द्वाविंशतितमः सर्गः। The oldest commentator, Jayamaṅgala, calls him *Bhaṭṭi*, son of *Svāmī*. His words are लक्ष्यं लक्ष्यं श्रीमद्यत्केन विदुषः प्रदर्शितुं श्रीखामिन्दुनः कविः भट्टिनामा रामकाव्याय महाकाव्यं चकार। Harihara, the next in age, follows his predecessor verbatim. Puṇḍarikākṣha, the 3rd in order of age, in his *Kalpā-dīpikā*, calls the poet *Bhaṭṭi*, but gives no specific name for the work. The fourth, Kandarpa Chakravartī, calls the work *Bhaṭṭi*, and the author *Bharṭṭihari*. His words are अथ तावन्नामसोपाध्याय श्रीभट्टहरिकविना महाकाव्योर्लक्ष्यं। The fifth, Vidyāvinoda, makes the author *Bharṭṭihari*, son of *Srīdhara Svāmī*: अथ कविना श्रीधरखामिन्दुनना भट्टहरिणा सर्गवन्तः। And lastly, Bharata Mallika, who lived at Kāncrāpara in the Hooghly district about 150 years ago, names *Bharṭṭihari*, but does not notice the name of his father: भट्टहरिनामकविः श्रीरामकाव्याय महाकाव्यं चकार।

Turning now to the writers of this century, I find the opinion to be equally divided. Colebrooke, in his essay on 'Sanskrit and Prākṛit Poetry,' follows the later commentators and says, "The author was *Bharṭṭihari*, not, as might be supposed from the name, the celebrated brother of *Vikramāditya*, but a grammarian and poet who was son of *Srīdhara Svāmī* as we are informed by one of his scholiasts, *Vidyāvinoda*. (Essays, vol. II, p. 116). Professor Aufrecht, in his Bodleian Catalogue, speaks of *Bharṭṭihari*, "*cujus liber grammaticus, minime vero Bhaṭṭikāvya'm memoratur*," (p. 175 b)

but in his notices of the *Praudha-manoramā*, (p. 162 b), of the *Subodhā*, (p. 175 a), of the *Amara-kosha*, (p. 182 b), and of the *Sarasvatī-kaṇṭhābharaṇa*, he cites Bhaṭṭi. In the last named work both Bhaṭṭi and Bhartṛihari have been separately cited. Dr. Bhau Dājī observes that Bhaṭṭi "is popularly believed to have been a son of Bhartṛihari," (Journal, Bombay B. R. A. S., J. 1862, p. 219). Bohlen, reciting a tradition which says "Vikrama in fact got possession of the kingdom and took to himself Bhaṭṭi as prime minister," remarks, "in this again they seem to have gone wrong, confounding both persons and times. For there exists a grammatical poem called Bhaṭṭi Kāvya, describing at the same time the exploits of Rāma, which has been attributed to a certain grammarian belonging to a later age called Bhartṛihari, and from the name of this poem, I think, Bhaṭṭi seems to have been considered as the brother of this our Bhartṛihari." (Preface to his edition of the *S'atakas* of Bhartṛihari, p. 6). In a note in the *Indian Antiquary* (I, p. 319) Paṇḍit Seshagiri Śāstrī gives a story (noticed also by Bohlen) which says that "a Brāhmaṇ, named Chandra-gupta, had four wives, one of the Brāhmaṇ caste, another of the Kshatriya, the third of the Vaiśya, the fourth of the Sūdra caste. They were called Brāhmaṇī, Bhānumatī, Bhāgyavatī and Sindhumatī. Each of the four bore him a son. Vararuchi was born of the first wife, Vikramārka of the second, Bhaṭṭi of the third, and Bhartṛihari of the fourth. Vikramārka became king, while Bhaṭṭi served him in the capacity of Prime-minister."

A critical survey of these several diverse opinions shows that the balance of evidence rests with those who take Bhaṭṭi to be distinct from Bhartṛihari. The three oldest scholiasts take Bhaṭṭi to be the name of the author of the Bhaṭṭi-kāvya, so does the MS. under notice, which is 478 years old. The old authors cited by Aufrecht all cite Bhaṭṭi and one of them Bhojadeva, author of the *Sarasvatī-kaṇṭhābharaṇa*, who lived over a thousand years ago, quotes from the works of both Bhaṭṭi and Bhartṛihari, showing clearly that in his time they were two distinct persons and not one with two names. It would not be critical to set aside their opinion on the authority of the three later Bengali scholiasts, none of whom lived at an earlier date than 250 years from this time. Colebrooke avowedly followed these later scholiasts, and does not seem to have made any careful enquiry on the subject. Professor Aufrecht's quotations should have created in him a doubt on the subject; but they did not. On the same page (175) he has given the two names without a remark. Bhau Dājī, Bohlen and Seshagiri Śāstrī recognise Bhaṭṭi to be distinct from Bhartṛihari. The traditions quoted by them are at best of little worth, but they are, as far as they go, opposed to the latest scholiasts.

Nor is it difficult to make out how the confusion has arisen. Bhaṭṭa

is an honorific title, meaning a learned man or a professor, and its derivative form Bhaṭṭi is very unlike a proper name, and the latter commentators felt the necessity of searching for something to replace it. How they fell upon Bhartṛihari it is not easy to guess. It may at first sight appear that they thought that Bhaṭṭi must be a corruption of some other word, and as *Bhatti* is the vernacular form of *Bharṭi* the conclusion was drawn that Bhaṭṭi stood for Bhartṛihari. This is, however, not philologically correct, inasmuch as *Bhatti*, the corruption of *Bharṭi*, takes the dental and not the cerebral t, and Bhaṭṭi is invariably written with the cerebral and not the dental letters. To Englishmen, most of whom cannot pronounce the dental letters, this may not appear a serious objection, but to Indians the distinction is so marked that it is difficult to conceive a confusion in this respect. There must have been some other cause, but I know not what it was. There is nothing, however, to preclude the use of Bhaṭṭi as a proper name. The diminutive of Bhaṭṭa would be Bhaṭṭi, and the young son of a Bhaṭṭa may well be called by the affectionate diminutive "the little professor" or "teacherling." Indian languages abound in such affectionate epithets, and they are not unknown in Europe. By long usage such epithets stick fast, and cannot afterwards be cast off. In many instances they have absolutely set aside the names given at christening. It may be added that nick-names have often been used as proper names, and the question then naturally arises, is Bhaṭṭi the proper or the nick-name of the author, but there is nothing to decide it. It might have been the one or the other, but certain it is that it was the most popular name, and the author was best known by it.

The next question refers to the name of the author's father. The authorities quoted above give Svāmī or Śrīsvāmī, Śrīdhara Svāmī, Bhartṛihari and Chandragupta. The last two occur in apocryptical stories, and may at once be rejected as false. Jaymaṅgala is the oldest, and appears to be a very cautious and critical scholiast, and he gives the first name which may be accepted as the most authentic. Svāmī is certainly a title, but there is nothing to prevent its use as a proper name, and if we accept the Śrī which precedes it as a part of the name and not an honorific epithet, there would be nothing to object to it. It may, however, be more reasonably taken to be an abbreviation, or the use of the literary title instead of the proper name. The use of titles for proper names is by no means uncommon.

The poet at the end of his work gives a stanza in which he describes his patron who, he says, was king Śrīdhara-sena of Balabhi. The stanza runs thus :—

काव्यमिदं विहितं मया बलभ्यां श्रीधरसेननरेन्द्रपाक्षितायां ।

कौर्भिरिथं भवतादत्तो वपस्व चेनङ्करः क्षितिषो यतः प्रजानाम् ॥ स १९ श्लोक १५ ॥

"May this poem, written by me in Balabhi, the protected of the great king Śrīdharasena, be to the glory of the king, since the king is the well-doer of the people."

The Balabhi here mentioned is obviously Balabhipura, the capital of the Saurāshṭra kingdom, and we know from Wathen's copper-plates that there were three Śrīdharasenas in the Balabhi, Balahara, or Balarāis dynasty.

The first of them reigned in A. D. 319. He was followed by Silāditya I, Charaḡriha I, and then by a second Śrīdharasena. We have then a Dhruva-sena and then a third Śrīdhara-sena. Which of these three kings was the patron of the poet cannot be made out, but there is no reasonable doubt that one of them was; and we may, therefore, safely place the time of our poet to be the middle or end of the fourth century A. D. As regards the name of the father, the first idea suggested by this stanza is that the commentators confounded the patron with the father of the poet, but, seeing that Śrīdhara in the case of the king is followed by the epithet sena, and in the case of the father by Svāmī, it might reasonably be urged that Śrīdhara the father was distinct from the king of that name. The poet has named the king, and the scholiasts have given the name of the poet's father. Anyhow it is obvious from the epithets assigned to him, and from the way in which he refers to the king, that the poet was not a king, nor the son of a king, nor a prime-minister. He was a Brāhmaṇ poet and grammarian of Balabhipura, and had no relation whatever to Vikramārka, Chandragupta, Vararuchi or Bhartṛihari. The time usually assigned to Bhartṛihari is the 3rd century of the Christian era, whereas my deductions bring Bhaṭṭi to the middle or end of the 4th century, showing a difference of about a hundred years—a slight difference in the case of oriental literary history, and by no means such as to prevent scholiasts of the 16th or the 17th or the 18th century from easily confounding the two authors.

Dr. A. F. R. HOERNLE read the following extracts from a letter from General A. Cunningham on some of the Antiquities exhibited at previous meetings of the Society.

"The gold coin with a ring, of which an engraving is given in the Proceedings for February, is quite new to me. I should like to have read the legend as

Sri Champa Raja

but there seems to be a vowel over the first letter of the name—unless indeed it be only an ornament. Can it be *Chaidya* Raja—The Raja of Chadi?

"I read Mr. Growse's seal as *Mattila*, which is a known name ; see Samudra Gupta's Allahabad Pillar inscription, line 18 of Prinsep's Plate in the Journal of the Asiatic Society of Bengal, November 1837. It is the second name in the line. The first letter cannot by any possibility be s."

Dr. HOERNLE communicated a new reading of the Arian Pāli Inscription on the so-called Sue Vihāra copperplate. He stated that this inscription had already been read, though imperfectly, by Sir E. C. Bailey and Professor Dowson, in 1870. (See J. A. S. B., vol. XXXIX, pp. 65-70, and J. R. A. S., Vol. IV, pp. 497-502.) Having recently had occasion to examine the copperplate, which forms part of the collection of this Society, he found that some of the letters had hitherto been misread. The rectification of these errors made the meaning of the inscription clear and consistent. Literally translated it is as follows: "On the 20th day of the month Daisios, in the 11th year of the great king, the Overking of kings, the son of the gods, Kanishka ; On the said day, to the mendicant Nāgadatta, learned in the Sāṅkhya (philosophy), the disciple of the Achārya Damatrātā, the disciple of the disciple of the Achārya Bhava, putting up his staff (or pillar) ; here the owner of the Dāmana Vihāra, a female lay-devotee, Balanandī, (who is) much given to penances, and Balajayā, her mother, give a shrine for the staff, and the customary accessories. May it be for the health and wealth of all beings." The paper will be published in the *Indian Antiquary*.

The following papers were read :—

1. *On the Temples of Deoghar.*—By DR. RĀJENDRALĀLA MITRA, C. S. I. (Abstract.)

The paper opens with a description of Deoghar, its situation, extent and population. Then follow some extracts from the Purāṇas on the origin of the Vaidyanātha temple. The substance of the legend is that Rāvaṇa, king of Ceylon, was in the habit of daily paying a visit to a lingam on the Kailāsa mountain, but, feeling the self-imposed task too troublesome, once sought the permission of the lingam to remove it to Ceylon. The lingam assented on the condition that the removal should be effected by Rāvaṇa without a break in the journey, or a deposition of the lingam on the ground any where in the way. Rāvaṇa agreed, but when bringing it through mid-air, was obliged to hand it over to a Brāhman, who deposited it at Deoghar. The principal temples of the place are all located in a courtyard in the north-east quarter of the town. The largest and most sacred one is barely 400 years old, and was erected by one of the Rājās of Gidhor. The rest are of later dates. The presiding divinity of the principal temple is a lingam about 3½ inches high,



and 4 inches in diameter. It is held in the highest veneration, and pilgrims by thousands resort to the place from all parts of India. During the principal festivals, the number of pilgrims varies from 40 to 60 thousand. The lingam is noted for effecting miraculous cures. On the north, the south and the west sides of the temple, there are verandas, in which from 40 to 60 persons are to be daily seen lying in absolute fast for days, in the hope of the divinity disclosing to them in dreams the remedy for their ailments. Most people are blessed with the dream on the 3rd, 4th or 5th day of their fast, but those who are not so blessed even on the 7th day are generally driven away on the 8th to prevent death by starvation. Cures are frequent, particularly of nervous diseases, such as hysteria and the like.

Some of the images in the minor temples are of Buddhist origin. In one temple a figure of Padmapāṇi is worshipped as Sūrya, and the image of a Bodhisattva does duty in another temple for the goddess of Dawn, Sandhyā. The author is of opinion that the place was originally the site of a Buddhist sanctuary which has been, since the expulsion of the Buddhists, appropriated to Hindu worship. The paper includes texts and translations of all the inscriptions available at the place, as also a drawing of the principal temple and a ground-plan.

This paper will be published in the Journal, Part I.

2. *On the origin of the so-called Kharakpur Meteorite.*—By V. BALL, M. A., F. G. S.

[Received 28th July; Read 3rd August, 1881.]

In the year 1848 a mass of iron supposed to be of meteoric origin, which had been found embedded in the soil on the top of the Kharakpur hills, was forwarded to the Asiatic Society. It was stated that it had been exhumed by the hillmen and had been an object of worship for many years.

Mr. Piddington, who had invited Capt. Sherwill to procure it for the Society, after a physical and chemical examination which is fully detailed in the Journal,\* pronounced it to be a veritable meteoric iron. The chemical examination was believed to have revealed the presence of nickel, cobalt and chromium, which metals commonly occur in meteoric irons. The metal was stated to exhibit the damasked lines known as Wiedemannstatten figures which are specially characteristic of meteoric irons.

The result was, in short, that this mass of metal weighing nearly 156½ pounds became renowned as the Kharakpur meteorite and for many years it held a place of honour in the case of meteoric stones in the Society's Museum. About the year 1860 a sample cut from it was

sent to Dr. Haidinger in Vienna and possibly specimens were also sent to other Museums in Europe.

Dr. Haidinger\* declared the iron to be of non-meteoritic origin, an opinion which was founded not only on the absence of true Wiedmann-statten figures, but also on an analysis of the metal by Herr Karl Ritter von Hauer which gave 98 per cent. of iron with a residue of silica and carbon; but no trace of either nickel or cobalt.

Recently, when writing the Chapter on Iron for the forthcoming volume on the Economic Geology of India, it occurred to me that it was necessary that the true nature of this iron should be discussed, for, if it were really native iron, it was, though not of meteoric origin, still worthy of notice. On enquiry I found that the specimen had been removed from the meteorite cases in consequence of its having been shown to be not entitled to its place there; but it seems that its true origin has never been declared. In conjunction with several of my colleagues, I am fully satisfied that it is nothing more nor less than an abnormally large ball or bloom of iron from a native furnace. This view affords a means of explaining the origin of the foot-like portion projecting from the mass which Mr. Piddington endeavoured to explain in connection with the meteorite theory. This foot was simply produced by the impress of the base of the chimney shaft over the hearth which became filled with the iron; such a projection, which is in other words a cast of the form of the bottom of the shaft, is to be seen on the majority of blooms, which resemble in shape inverted 'button' mushrooms with a portion of the stalk remaining.

The Kharakpur iron differs from the native smelter's ordinary bloom in being somewhat larger and in being of less symmetrical shape than is usual. Its preservation and employment as an object of worship were doubtless connected with these facts. It is possible that the hearth may have been of the ordinary size but by a subsidence, due perhaps to an unobserved hollow or ant burrow in the soil underneath, it became enlarged on one side; and thus a long time elapsed after the smelting had commenced before the accumulated metal rose to the usual level at the base of the shaft, when the smelter's custom is to stop the blast, break down the front of the furnace, and pull out, hammer and cut the bloom in two. It may have been that the smelters, already alarmed by the unusual consumption of ore and fuel, were fairly frightened out of their senses when they saw the size of the bloom and thought it was the old *Bhút* himself, and at once proceeded to perform homage, which continued to be offered by their descendants till the time when the bloom was

\* Sitzung. der Kais. Akad. Wien, XLV, p. 672.

carried off by an Indigo Planter who presented it to the Society through Capt. Sherwill.

Another simpler explanation of the cause of its having escaped the usual treatment of blooms may possibly be attributable to the fact that its large size, and the comparatively cold state of a great portion of it, rendered it impossible for the smelters to hammer it out.

That the first suggestion, however, is not an extravagant one may be gathered from the fact that recently, when in the close vicinity of the locality where this iron was obtained, I was shown an iron mine which had been deserted for the following reason. Some of the ore had been treated in the usual way, and on the smelters tapping the furnace, so the story goes, two streams, one of blood and the other of milk, flowed from it. Several deaths happened shortly after in the families of the smelters, and since that time, now twelve years ago, no more of that unlucky ore has been used in the furnaces.

As a possible explanation for the origin of the stream of milk, it may be suggested that the ore may have been partly of tin or lead, and the white metal which flowed forth may have suggested milk. The stream of blood may have been imaginary, the idea being simply added to improve the story.

3. *Second List of Rhopalocerous Lepidoptera from the Andaman Islands, with Descriptions of new or little-known Species and Varieties.*—By J. WOOD-MASON, Deputy Superintendent, Indian Museum, Calcutta, and L. DE NICEVILLE.

(Abstract.)

Since the publication of their first list of Andamanese Butterflies, the authors have received from their active correspondent, Mr. A. R. de Roepstorff, 17 additional species, 13 of which have not been previously recorded therefrom, thus bringing up the total of species from these islands to 125.

The following are the species which are new to the islands or upon which notes are given :—

1. *Cyrestis horatius*, n. sp. Allied to *C. cocles*, which it closely resembles in the character of the markings, but from which it differs in the ground-colour of the upperside being pure white marked with different shades of sepia-brown, in having a pale fulvous patch at the anal angle of the posterior wings, and, on the underside, in having only the lightest portions of the sepia markings absent. Nine males from S. Andaman.

2. *Cyrestis thyodamas*, var. *andamanica*, nova. Differs from all continental examples in the bright fulvous, almost ferruginous, anal region of the posterior wings, &c. A large series of males from S. Andaman.

3. *Neptis jumba*, Moore.

4. *Lampides malaya*, Horsfield.
  5. *Arrhopala amantes*, Hewitson.
  6. *Amblypodia* (? *Narathura*) *fulla*, var. *andamanica*, nova. Has the wings above brilliant violet-cyaneous and rather more broadly bordered with black-fuscous: below, pale subochraceous-fuscous with very faint discocellular marks on both pairs and basal marks on posterior ones. Intermediate between *A. fulla*, Hewitson, from Bouru, and *A. arsenius*, Felder, from Luzon. A minute tooth-like tail to posterior wing. One male from S. Andaman.
  7. *Papilio rhodifer*, Butler. Female described.
  8. *Papilio læstrygonum*, W.-M. Female described.
  9. *Papilio prexaspes*, Felder. Female described.
  10. *Ismene malayana*, Felder. Female described.
  11. *Ismene exclamationis*, Fabr.
  12. *Ismene harisa*, Moore.
  13. *Ismene badra*, Moore.
  14. *Telegonus acroleucus*, n. sp. Anterior wings above tipped with ashy-white and bearing three large diaphanous and lustrous yellow discal spots arranged as in *T. thrax*, than which it is much smaller, &c. Numerous males from S. Andaman.
  15. *Plesioneura paralysos*, n. sp. Close to *P. alysos*, but differing therefrom in its broader and less irregularly-margined white band and in having only a single small spot on anterior wings, but two on posterior wings below. Three males and a female from South Andaman. Continental specimens differ in having no trace of the white spots on the underside of the posterior wings.
  16. *Plesioneura dan*, Fabr. Differences between Andaman and continental specimens pointed out.
  17. *Plesioneura leucocera*, Kollar. Separable by no constant character from several other species since described from other localities.
  18. *Tagiades bhagava*, Moore. Female described and notes on male given.
  19. *Hesperia sala*, Hewitson. Re-described and stated to be nearest allied to *H. divodasa*, Moore.
  20. *Hesperia praba*, Moore.
  21. *Telegonus thyrsis*, Fabr. The secondary sexual characters of male described.
- The paper, which is illustrated by a coloured plate, will be published in the Journal, Part II, No. 4 for the current year.

## LIBRARY.

The following additions have been made to the Library since the meeting held in July last.

## TRANSACTIONS, PROCEEDINGS AND JOURNALS,

*presented by the respective Societies and Editors.*

- Baltimore. American Chemical Journal, Vol. I. Nos. 1—6; Vol. II, Nos. 1—6; Vol. III, Nos. 1—3.
- . American Journal of Philology, Vol. I, Nos. 1—4; Vol. II, No. 5.
- . Register of the Johns Hopkins University, for 1880-81.
- . American Journal of Mathematics, Vol. III, Nos. 1—3.
- Berlin. K. preussische Akademie der Wissenschaften,—Monatsbericht, February 1881.
- Bombay. The Indian Antiquary,—Vol. X, Part 121, July 1881.
- Bordeaux. Société de Géographie Commerciale,—Bulletin, Nos. 12-13.
- Calcutta. Geological Survey of India,—Memoirs, Vol. XVIII, Part 1.
- . Register of Meteorological Observations for June 1880.
- Colombo. Royal Asiatic Society, Ceylon Branch,—Proceedings, 1875-80.
- . ———— Journal,—Part II, 1880; and Vol. VII, Part 1, No. 23, 1881.
- Copenhagen. Aarboger for Nordisk Oldkyndighed og Historie, Nos. 3 and 4, 1880.
- Frankfurt. Senckenbergische Naturforschende Gesellschaft,—Abhandlungen, Vol. XII, Nos. 1 and 2.
- . ———. Bericht, 1879-80.
- Florence. Archivio per l'Antropologia e la Etnologia, Vol. III, Parts 1—4; Vol. IV, Parts 1—4; Vol. V, Parts 1—4; Vol. VI, Parts 1—4; Vol. VII, Parts 1—4; Vol. VIII, Parts 1—4; Vol. IX, Parts 1—3; and Vol. X, Parts 1—3.
- Leipzig. Wissenschaftlicher Jahresbericht,—Part 1, 1878.
- . Deutsche Morgenländische Gesellschaft,—Zeitschrift, Vol. XXVI, Parts 3—4; Vol. XXXV, Part 1.
- . Abandlungen für die Kunde des Morgenlandes, Vol. I, Nos. 4—5; and Vol. VI, Nos. 1—4.
- London. Royal Astronomical Society,—Monthly Notices, Vol. XII, No. 6, April 1881.
- . Institution of Civil Engineers,—Minutes of Proceedings, Vol. LXIII, Part 1, 1880-81.

- London. Society of Telegraph Engineers,—Journal, Vol. X, No. 36.  
 ———. Institution of Mechanical Engineers,—Proceedings, No. 1, January 1881.  
 ———. Anthropological Institute of Great Britain and Ireland,—Journal, Vol. X, No. 3, February 1881.  
 ———. ———. List of Members, April 1881.  
 ———. Statistical Society,—Journal, Vol. XLIV, Part 1, March 1881.  
 ———. Royal Society,—Proceedings, Vol. XXXI, No. 211.  
 ———. Zoological Society of London,—Proceedings, Part 4, 1880.  
 ———. ———. Transactions,—Vol. XI, Parts 3—4.  
 ———. Royal Geographical Society,—Proceedings, Vol. III, No. 6, June 1881.  
 ———. Nature, Vol. XXIII, Nos. 591, 595, 598 and 600; Vol. XXIV, Nos. 601, 607—610.  
 ———. The Academy, Nos. 476—479.  
 ———. The Athenæum, Nos. 2799—2802.  
 Lyon. Société de Géographie,—Bulletin, Vol. III, No. 20, 1880.  
 Melbourne. Royal Society of Victoria,—Transactions and Proceedings, Vol. XVII.  
 Munich. Repertorium für Experimental-Physik, Vol. XVII, Nos. 1—7.  
 Paris. La Société de Géographie,—Bulletin, March 1881.  
 ———. La Société d'Anthropologie,—Bulletin, Vol. III, Part 4, July to December 1880.  
 Simla. United Service Institution of India,—Journal, Vol. X, No. 47, 1881.  
 St. Petersburg. L'Académie Impériale des Sciences de St. Petersburg,—Mémoires, Vol. XXVIII, Nos. 1 and 2.  
 ———. ———. Bulletin, Vol. XXVII, Nos. 1—2.  
 Pisa. Società Toscana di Scienze Naturali,—Atti, Processi Verbali, 8th May, 1881.  
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 ———. Osservatorio della Regia Università,—Bollettino, 1880.  
 Vienna. Anthropologische Gesellschaft,—Mittheilungen, Vol. X, Nos. 10—12.  
 ———. K. k. geologische Reichsanstalt,—Jahrbuch, Vol. XXXI, No. 1, January to March, 1881.  
 ———. ———. Verhandlungen, Nos. 1—7, 1881.

### BOOKS AND PAMPHLETS,

*presented by the Authors.*

- BANDOW, CHB. J. The Precedents of Princess Thoodamma Tsari. Translated with numerous explanatory notes, and a vocabulary of the Pali and difficult Burmese words in the text. Demy 8vo. Rangoon, 1881.

- BANDOW, CHR. J. *Prince Weezaya, a Burmese Drama*. Translated. Demy 8vo. Rangoon, 1872.
- BÖHTLINGK, DR. O. *Sanskrit Wörterbuch in kürzerer Fassung, Part II, 2.* 4to. St. Petersburg, 1881.
- THOMAS, EDWARD. *The Revenue Resources of the Mughal Empire in India from A. D. 1593 to A. D. 1707. A supplement to the Chronicles of the Pathan Kings of Delhi.* 8vo. London, 1871.

### MISCELLANEOUS PRESENTATIONS.

- General Rules and Circular Orders of the High Court of Judicature at Fort William in Bengal (Appellate Side, Civil). 8vo. Calcutta, 1881.
- "      "      (Appellate Side, Criminal). 8vo. Calcutta, 1881.
- Report on the Charitable Dispensaries under the Government of Bengal for the year 1880. Fcp. Calcutta, 1881.
- Administration Report on the Jails of Bengal for the year 1880. Fcp. Calcutta, 1881.
- Thirteenth Annual Report of the Sanitary Commissioner for Bengal, 1880. Fcp. Calcutta, 1881.
- Archæological Survey of India, Reports, Vols. X and XI. 8vo. Calcutta, 1880.

#### BENGAL GOVERNMENT.

- BURGESS, J. and INDRAJI, BHAGWANLAL.—(Archæological Survey of Western India, Reports, No. 10.) *Inscriptions from the Cave Temples of Western India, with Descriptive notes, &c.* 4to. Bombay, 1881.

#### BOMBAY GOVERNMENT.

- Report on the Excise Revenue in the Central Provinces, for the year 1880-81. Fcp. Nagpur, 1881.
- Report, with the Chief Commissioner's Review, on Education in the Central Provinces, for the year 1880-81. Fcp. Nagpur, 1881.

#### CHIEF COMMISSIONER, CENTRAL PROVINCES.

- TORNOE, H. *The Norwegian North-Atlantic Expedition, 1876-78. Chemistry.* 4to. Christiana, 1880.
- COLLETT R. *The Norwegian North-Atlantic Expedition, 1876-78. Zoology,—Fishes.* 4to. Christiana, 1880.

#### THE EDITING COMMITTEE.

- EUTING, DR. J. *Qolasta, oder Gesänge und Lehren von der Taufe und dem Ausgang der Seele als mandäischer Text mit sämtlichen Varianten nach Pariser und Londoner Manuscripten, mit Unterstützung der deutschen morgenländischen Gesellschaft in Leipzig.* Fol. Stuttgart, 1867.
- BOETTICHER, PAULUS. *Epistolæ Novi Testamenti Coptice.* 8vo. Halæ, 1852.

Indische Studien, Vol. X, Nos. 1, 2 and 3. 8vo. Leipzig, 1867-68.

GERMAN ORIENTAL SOCIETY.

Archæological Survey of India, Reports, Vols. X and XI. 8vo. Calcutta, 1881.

On the Manufacture of Iron and the Future of the Charcoal Iron Industry in India. Fcp. Allahabad.

The Indian Antiquary,—Vol. X, Part 121, July 1881.

HOME DEPARTMENT.

Institution of Mechanical Engineers. Library Catalogue, May 1881.

With Subject Index of Papers in the Proceedings, 1847-80. 8vo. London, 1881.

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Catalogus der Bibliotheek van het K. Zoölogisch Genootschap, Natura Artis Magistra, te Amsterdam. Roy. 8vo. Amsterdam, 1881.

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Annual Report of the Board of Regents of the Smithsonian Institution for the year 1879. 8vo. Washington, 1880.

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### PERIODICALS PURCHASED.

Boston. Journal of Natural History,—Vol. VI, Nos. 1—4.

Calcutta. Indian Forester,—Vol. VII, No. 1, July 1881.

———. Calcutta Review,—Vol. LXXIII, No. 145, July 1881.

———. Indian Medical Gazette,—Vol. XVI, No. 7, July 1881.

Geneva. Archives des Sciences Physiques et Naturelles,—Vol. V, Nos. 1—6.

No. 2. *Bayer*.—Reproduction artificielle de l'indigo. Voyage sur le "Challenger:" Zoologie.

No. 4. *Wartmann, M. le Prof. E.*—Recherches sur la végétation.

No. 5. *Marsh*.—Les *Odontornithes*, ou oiseaux fossiles à dents de l'Amérique du Nord, décrits.—*Gnehm, R.*—Essais sur la transformation de la cumarine et de ses dérivés en dérivés du groupe de l'indigo. *Lunge, G.*—Détermination du soufre dans les pyrites.

No. 6. *Renevier, L.*—Congrès géologique international à Bologne: Rapport du Comité suisse sur l'unification de la nomenclature.

Göttingen. Gelehrte Anzeigen,—Nos. 25—28.

———. Nachrichten,—No. 10, 1881.

Leipzig. Annalen der Physik und Chemie,—Vol. XIII, No. 6.

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London. Nineteenth Century,—No. 52, June 1881.

———. Messenger of Mathematics,—Vol. X, No. 12, April 1881.

———. Journal of Botany,—Vol. X, No. 222, June 1881.

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- London. *Annals and Magazine of Natural History*,—Vol. VII, No. 42, June 1881.
- . London, Edinburgh and Dublin *Philosophical Magazine*,—Vol. XI, Nos. 70—71.
- . *Journal of Science*,—Vol. III, No. 90, June 1881.
- . *Publishers' Circular*,—Vol. XLIV, Nos. 1050—51.
- . *Chemical News*,—Vol. XLIII, Nos. 1125—1126, Index; and Vol. XLIV, Nos. 1127—1128.
- . *Society of Arts*,—*Journal*, Vol. XXIX, Nos. 1490—1494.
- Paris. *Annales de Chimie et de Physique*,—Vol. XXIII, May and June 1881.
- . *Comptes Rendus*, Vol. XCII, Nos. 23—26, and Index to Vol. XCI.
- . *Revue Scientifique*, Vol. XXVII, Nos. 25—26, and Vol. XXVIII, Nos. 1—2.
- . *Revue Critique*, Vol. XI, Nos. 24—26, and Vol. XII, No. 27.
- . *Revue des deux Mondes*—Vol. XLV, No. 4; Vol. XLVI, No. 1.
- . *Journal des Savants*,—June 1881.

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- BADGER, GEO. PERCY. *An English-Arabic Lexicon, in which the Equivalents for English Words and Idiomatic Sentences are rendered into Literary and Colloquial Arabic.* 4to. London, 1881.
- BOWERBANK, J. S. *A Monograph of the British Spongiadæ*, Vol. III. 8vo. London, 1874.
- BRADY, G. STEWARDSON. *A Monograph of the Free and Semi-Parasitic Copepoda of the British Islands*, Vols. I—III. 8vo. London, 1878—80.
- BUCKTON, GEO. BOWDLER. *Monograph of the British Aphides*, Vols. I, II and III. 8vo. 1876—81.
- St. E'tienne. *Congrès Provincial des Orientalistes Français*,—*Egyptologie*, I Bulletin, Vol. II. 8vo. Saint-E'tienne, 1880.
- DAVIDS, T. W. Rhys. *Buddhist Sutras*, translated from Pali. (F. Max Müller's "Sacred Books of the East," Vol. XI.) 8vo. Oxford, 1881.
- HEWITSON, WILLIAM C. *Exotic Butterflies*. Part 82, April 1st 1872; and Part 83, July 1st 1872. 4to. London, 1872.
- MURRAY, JAMES A. *The Plants and Drugs of Sind; being a Systematic Account with Descriptions of the Indigenous Flora, and Notices of the Value and Uses of their Products in Commerce, Medicine and the Arts*. Roy. 8vo. London and Bombay, 1881.
- SOWERBY, G. B. *Thesaurus Conchyliorum*, Parts 35 and 36. 4to. 1880.
- The Zoological Record for 1879* (Vol. XVI). 8vo. London, 1881.
- WRIGHT, DR. WILLIAM. (Palæographical Society.) *Facsimiles of Ancient MSS.* Oriental Series, Part VI. Fol. London, 1881.

PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
FOR NOVEMBER, 1881.

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The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 2nd November, at 9 P. M.

C. H. TAWNEY, Esq., M. A., Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

From St. Xavier's College Observatory,—Results of Observations, January to June 1881.

From the Hungarian Academy of Sciences,—(1) *Codex Cumanicus Bibliothecæ ad Templum divi Marci Venetiarum*, by Comes Géza Kuun, (2) *Nyelvemléktár. Régi Magyar Codexek és Nyomtatványok*, Vols. VII and VIII, by J. Budenz, G. Szarvas, and A. Szilády.

From the British Museum,—(1) *Catalogue of the Persian Manuscripts in the British Museum*, Vols. I and II, by Chas. Rieu, (2) *Catalogue of Oriental Coins in the British Museum*, Vol. VI, (3) *Catalogue of the Birds in the British Museum*, Vol. V, by R. B. Sharpe, (4) *Illustrations of Typical specimens of Lepidoptera Heterocera in the collection of the British Museum*, Pt. V, by A. G. Butler.

From the Editing Committee, The Norwegian North Atlantic Expedition 1876-78, Zoology, *Gephyrea*, by D. C. Danielssen, and Johan Koren.

From the Johns Hopkins University,—On the Mechanical Equivalent of Heat, with Subsidiary Researches on the Variation of the Mercurial from the Air Thermometer and on the Variation of the Specific Heat of Water, by Henry A. Rowland.

From the Home Department,—Sacred Books of the East, Vols. X and XI, edited by Max Müller.

From the Society,—Katalog der Bibliothek der deutschen Morgenländischen Gesellschaft, II.

From the Authors,—(1) On the Land Shells of the Island of Socotra collected by Professor Bayley Balfour, by Lieut.-Col. H. H. Godwin-Austen, (2) Bilingual Coins of Bukhara, by Edward Thomas.

From the Indian Museum,—Annual Report for April 1880 to March 1881.

From the Geological Survey of India,—Popular Guides to the Geological collections in the Indian Museum No. 1, Tertiary Vertebrata, by R. Lydekker, No. 2, Minerals, by F. R. Mallet, and No. 4, Palæontological Collections, by Dr. O. Feistmantel.

From the Marine Survey Department,—Return of Wrecks and Casualties in Indian waters for the year 1880, and charts of (1) Stewart's Sound, (2) Sadashivgad Bay including Port Karwar and Beikul Cave, (3) Arabian Sea.

From J. V. Juggarrow's Observatory,—Results of Meteorological Observations, 1880.

From Lieut. R. C. Temple,—Note on two Maps of the Andaman Islands (with Maps), by E. H. Man and Lieut. R. C. Temple.

From the Meteorological Reporter to the Government of India,—Report on the Meteorology of India in 1879, 5th year.

From the Panjab Government,—(1) A complete Dictionary of the Terms used by Criminal Tribes in the Panjab together with a short History of each Tribe, and the Names and Places of Residence of individual Members, by Muhammad Abdul Ghafur, (2) Appendix—A detailed Analysis of Abdul Ghafur's Dictionary of the Terms used by Criminal Tribes in the Panjab, by Dr. G. Leitner, (3) A sketch of the Changars and of their Dialect by Dr. G. W. Leitner.

From the Société Zoologique de France,—De la Nomenclature des Êtres Organisés.

From the Society,—Catalogue de la Bibliothèque de la Société Nationale des Sciences Naturelles et Mathématiques de Cherbourg, Pt. I, by Auguste le Jolis.

From Mr. J. de Goeje,—The History of the Almohades by Abdo'l-Wáhid al-Marrékoshí, by R. Dozy.

From the Government, N. W. P.—Notes on the Economic Products of the North-Western Provinces, Pt. V.

The SECRETARY read the following extracts from a letter from Dr. R. Mitra forwarding a presentation copy of his work entitled: "Indo-Aryans: Contributions towards the Elucidation of their Ancient and Mediæval History."

"Will you do me the favour to present the accompanying two volumes to the Asiatic Society at its next meeting? The Library of the Society afforded me the materials for my researches; the kind consideration shown me by the Society enabled me to persevere in my undertaking; and the publications of the Society provided me the means of bringing to light the fruits of my labours. In now bringing out a new edition of my

essays, I cannot allow the opportunity to pass without expressing my grateful acknowledgments to the Society."

The **PRESIDENT** announced that, according to Rule 7, the following Gentlemen had been elected Ordinary Members of the Society by the Council during the recess :—

H. M. Percival, Esq., proposed by C. H. Tawney, Esq., seconded by A. W. Croft, Esq.

Chr. J. Bandow, Esq., proposed by Dr. A. F. R. Hoernle, seconded by Dr. H. W. M'Cann.

These elections were confirmed by the meeting.

The **SECRETARY** reported that since the last meeting in August, the following Gentlemen had intimated their desire to withdraw from the Society :—

Dr. D. B. Smith, H. K. W. Arnold, Esq., and that the elections of the following Gentlemen had been cancelled under Rule 9, as they had not paid their admission fee and first quarter's subscription :—

R. O. Lees, Esq., proposed by L. Schwendler, Esq.

Babu Peary Mohan Guha, proposed by Babu Adharlal Sen.

Babu Trailokyanath Mitra, proposed by Babu Adharlal Sen.

The following Gentleman duly proposed and seconded at the September meeting of the Council was elected an Ordinary Member :—

L. de Nicéville, Esq., proposed by H. B. Medicott, Esq., seconded by Dr. J. Anderson.

The following Gentlemen are candidates for ballot at the next meeting :

R. Logan, Esq., proposed by Hon. H. J. Reynolds, seconded by J. Westland, Esq.

J. J. Monteath, Esq., M. D., proposed by J. Wood-Mason, Esq., seconded by Dr. D. D. Cunningham.

The **COUNCIL** reported that, in consequence of the deaths of Sir John Philippart, the Count de Noe, Professor Isaac Lea, Colonel W. Munro, and Sir J. W. Colville, there were five vacancies in the list of Honorary Members, and recommended to the Society the four following gentlemen for election as Honorary Members at the next meeting :—

Dr. William Wright, Professor of Arabic in the University of Cambridge, on account of his distinguished services to Arabic scholarship.

Dr. Rudolph v. Roth, Professor of Sanskrit in the University of Tübingen, for his services to Sanskrit scholarship, especially in co-editing the St. Petersburg Sanskrit Dictionary and the Atharva Veda Sanhita.

Sir William Thomson, Professor of Natural Philosophy in the University of Glasgow, and Hermann L. F. Helmholtz, Professor of Physics in the



At first they satisfied their thirst by plunging their faces into water and drinking like cattle: but they have now learned to drink out of a glass or from a tap. They have made no improvement, however, in the matter of food, which is principally flesh-meat either eaten raw or rudely cooked by placing it for a few minutes on hot cinders. When coins were first presented to them by visitors, they mistook them for food and tried to eat them: on finding out their mistake, they threw them away in disgust. They refuse to sleep on anything but a rude bed of straw, which they take no trouble to renew. They remain generally quite silent, rarely speak to one another, and then only in a low voice, and only show any vivacity of expression when they are eating their meals.

COL. TENNANT says of these photographs—

“Low as their intellect is said to be, I do not think that the photographs show any great want of natural intelligence, and in this respect they agree with my own impression. Indeed, I think they are not unfair likenesses of the people.”

The SECRETARY read the following letter from Mr. J. B. N. Hennessey, F. R. S., Deputy Superintendent, Survey of India, on an outburst of sun-spots observed at Dehra Dun:—

“The following particulars of an outburst of sun-spots may be of interest to the Society not only on account of the magnitude of the occurrence but because the time of the event is known within *small* limits.

“I premise briefly, that a Photoheliograph is in daily use at the office of the Trigonometrical Branch Survey of India, Dehra Dun, of which I have executive charge. At present the instrument yields only 4-inch pictures. At least two negatives are taken daily of the sun when visible.

“On the 25th July 1881, the earliest negative obtained was at 3h. 58m. P. M. (Local Apparent Time): it exhibited several sun-spots as is now usual and of which therefore little need be said, for it is no doubt known to the Society that the sun for some months past has resumed a state of considerable energy in respect to development of features: this negative for the sake of distinction may be understood by  $N_1$ . The second negative or  $N_2$  was taken at 4h. 47m. P. M. On comparing  $N_1$  and  $N_2$ , it was at once seen that in the interval of 49m. a considerable group of spots had appeared in the neighbourhood of the sun's centre. It is difficult to reproduce with fidelity such features from so small a negative even by means of a silver print. I, however, enclose a hand-tracing of the negative  $N_2$  (Plate III), in which the new group of spots is shown in red, so that the position of the group may be nearly inferred.

“This new group consists of 16 spots of which no individual spot is notably large, but there is this peculiarity about them all that they exhibit hardly any penumbra but consist almost entirely of well defined umbra:

what penumbra appears is confined chiefly to two spots, where it is seen only to the S. E.

"As to magnitude, the spots are scattered over an area of some 6000 millions of square miles, while the collective area of the spots themselves is about 680 millions of square miles, or, say, 6 times the area presented by the earth to a distant spectator.

"Unhappily the sun remained invisible till the 30th July, when two negatives were taken, *i. e.*, after an interval of just 5 days; so far as solar rotation could effect, the so-called new group of  $N_2$  should have been visible not far from the sun's western edge; but the entire group had vanished leaving no trace behind. In the interim of 5 days, 2 new spots had come out; of *one* of these I may add that the umbra is about 200 millions of square miles and the penumbra some 700 millions, presenting in all a single feature of more than 900 millions square miles, or say 9 times the area exhibited by the earth to a distant spectator.

"It will be seen from the foregoing that a considerable group of sun-spots burst into view about the centre of the sun on 25th July 1881 between the hours of 3h. 58m. P. M. and 4h. 47m. P. M. local apparent time, Dehra Dun."

DR. M'CANN drew the attention of the Society to some letters which had appeared in "Nature" from Professor Piazzi Smyth, which were of interest in connection with the outburst of sun-spots observed by Mr. Hennessey. It appears that on January 26th of this year, a most peculiar series of clouds formed in the upper regions of the atmosphere above Madeira. These clouds resembled closely the appearances observed in vacuum-tubes through which electrical discharges are passing: and Professor Smyth attributes their formation to the passage of electrical discharges from the earth through the upper rarefied regions of the atmosphere. Professor Smyth, who had an observatory fitted up at Madeira, found that, simultaneously with this extraordinary cloud phenomenon, there was a sudden outburst of sun-spots in the centre of the sun's disc. A month afterwards, on July 26th, a precisely similar series of clouds was formed over Madeira. From its exact resemblance to that of June 26th, Professor Smyth formed the opinion that there would probably be a similar outburst of sun-spots: but, as his observatory was by this time dismantled, he was unable to verify this inference. Now, however, Mr. Hennessey's independent observation at Dehra Dun shows that Professor Smyth's inference was correct, and that in this case also the appearance of the electrical cloud was immediately preceded by a sudden outburst of sun-spots, indicating a sudden increase of solar activity.

The SECRETARY read a communication from the Under-Secretary to the Government of Bengal, Judicial Department, giving some particulars of the tenets, habits, customs, and places of residence of the sect of Hindu

dissenters called "Kumbhupatias," who recently made an attack on the Temple of Jaggannath in Puri, with the object of burning the idol of Jaggannath, during which one of them was killed. The Chief Commissioner of the Central Provinces gives the following account of the sect.

"There is a peculiar sect of Hindu dissenters in the Sambulpore district, known as Kumbhupatias. The word Kumbhupatia is derived from 'kumbhu,' the name of a kind of tree, and 'pat,' the bark of a tree, and the sect is so called because its followers make ropes from the bark of the tree and wear them round their waists. The religion is also known as that of *Alekh*, and its followers claim revelation as its foundation. Alekhschwamy, the god incarnate, used, it is said, to reside in the Himalayas, but about the year 1864 he came to Malbaharpore in Banki, zillah Cuttack, and revealed the religion professed by the Kumbhupatias to 64 persons, the principal of whom was Govind Dass; and it is chiefly owing to the exertions of these disciples that the religion was propagated. Alekhschwamy (which signifies 'the lord whose attributes cannot be described in writing') removed to Dhenkanal, a feudatory State in Cuttack, where, for three years immediately preceding his death, he led the life of a mendicant and wanderer. Although the religion originated in Cuttack, it spread more rapidly in the district of Sambulpore, and men of all classes and castes, except the Uriya Brahmans, are freely embracing it. It is not so much the peculiarity of the rules of any particular caste or sect that tends to increase the number of converts to it as the position in life of the converts themselves: thus in Khinda the people of a whole village embraced the Kumbhupatia religion because the Gaontia had done so. The names of some thirty villages are given as those in which the Kumbhupatias chiefly reside.

"There are three sects of Kumbhupatias—(1) the Kumbhupatias proper, who wear ropes made of the bark of trees; (2) the Kanapatias, who wear rags; and (3) the Ashritas or Grosthes, who lead a family life. The first two sects renounce the world and make no distinction of caste. They eat food given by people of any caste, except by a Raja, who is supposed to accumulate his wealth by oppressing and torturing his subjects; by a Bráhmaṇ or *bhandari*, because he accepts gifts made in *shradh* ceremonies; by a washerman, because he washes the clothes of all classes of people; and by a *hadi*, because his occupation is filthy. The third sect do not renounce the world nor deem celibacy essential, nor are they turned out of caste. They look up to the other two sects as their '*gurus*' or spiritual guides, and follow their religion. They bathe in the early morning.

"Each sect has a separate temple or place of prayer. They believe in one Supreme Being, who is called Alekh; truthfulness, obedience to spiritual guidance, and faith are the principal tenets of their religion. They believe in the existence of the thirty-three crores of Hindu gods and god-



desses, but they do not respect their images, as they argue that it is impossible to represent the form of the Supreme Being, whom no one has ever seen, nor do they worship the Hindu gods and goddesses; there is indeed reason to think that, unlike the followers of Ramanand, Kabir, and Chaitanya, they have an antipathy to them, as they dislike to touch the *tulsi* plant, because it is held sacred by the Hindus, and will not eat the flesh of a goat, because it is offered in sacrifice to the Hindu goddess Kali. They eat and drink only in the daytime; if they feel hungry or thirsty at night they can drink water only. They pray in the open air every day (morning and evening) with their faces turned towards the sun, and with their hands folded and held at the nose. If four or more persons join in the prayer, one of them recites, in humble words and suppliant voice, the praises of the Almighty, the others repeating the words after him. They bow down, prostrating themselves to the ground, 64 times, corresponding to the number of disciples of their god. Their habits are very filthy. They take no medicine, but rely on the help of their god alone for recovery: in case of severe illness, they take a little earth from the prayer-ground, mix it with rice-water, and drink the mixture. During the past two years the Kumbhupatias have divided into two sections. Formerly Bhima Kondh of Sonepore was the leader of the sect. Bhima was born blind, but he appears to have been endowed with natural talents of a superior order. Though unable to read and write, he had some Uriya religious books, such as the Mahabharat and Srimat Bhagbat, read to him; and the education he thus received enabled him to compose two or three volumes of verses in praise of the Almighty, which, it asserted, would do credit to any Uriya scholar of the present day. He exercised great influence over his followers. The relations existing between him and a female companion, however, excited suspicion among his adherents, who, however, did not venture to question the purity of his conduct until the woman became pregnant. Bhima endeavoured to deceive his followers by telling them that the woman would give birth to Arjun, who would root out all unbelievers. They believed this story, and waited until the child was born, when, to their great surprise, they found that the woman gave birth to a girl. Bhima accounted for this by saying that it had recently been revealed to him that the woman would give birth to a female, who would destroy all the unbelievers by means of her charms. The child, however, died a few days later, and Bhima then tried to mislead his followers still further by saying that the fairy had quitted this world because she had found it filled with the vices of mankind. He was now deserted by most of his followers, who formed a separate faction, but he is still highly adored and honoured by the remainder. He has erected an altar, over which he and his wife sit in the morning. His followers worship them and move round the altar until the time for their morning meal arrives, when their feet are washed

with milk, which is afterwards drunk by their adherents. Another cause of dissension was because Bhima pretended that he himself was their god.

"The Kumbhupatias who made a crusade against Jaggannath were residents of Chunderpore. Dasa Ram, the leader of the party which proceeded to Puri, and who was killed in the scuffle at the temple, thought that, if Jaggannath were burnt, it would convince the Hindus of the futility of their religion, and that the whole world would thereby embrace the true religion. This account is given by some of the Kumbhupatias who reside in Sambulpore; and it is not improbable that the man was actuated by dreams, in which the Kumbhupatias firmly believe. If any member of the fraternity breaks any of the rules, speaks an untruth, or commits a crime, he is excommunicated. A man undergoes an examination before he is admitted into the sect. It is stated that the tehsildar of Ungul in Cuttack has been successful in reducing crime within his jurisdiction by encouraging a criminal class called "Pans" to embrace the Kumbhupatia religion."

The PHILOLOGICAL SECRETARY read a Memorandum on some coins by Mr. T. A. M. Gennoe, with notes by General A. Cunningham and Dr. Rájendralála Mitra.

These coins were five in number, but in the opinion of General A. Cunningham and Dr. Hoernle only two of them were genuine: and these are already noticed in Marsden's *Oriental Coins*, pp. 735 ff. and, according to General Cunningham, can be procured readily in every large town in Northern India.

The following papers were read—

1. *On a Silver coin of Shams-ud-din Kaimurs.*—By J. G. DELMERICK.  
*With a note by GENERAL A. CUNNINGHAM.*

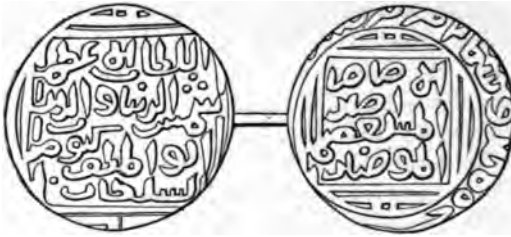
Mr. DELMERICK says:

"After the murder of Muíz-ud-din Kaikobad on the 18th Shavval A. H. 689 (October A. D. 1290), Jallal-ud-din Firoz, in order to gratify the people and silence the opposition of the army, having obtained possession of the murdered king's only child, an infant of three years of age, placed him upon the throne, and caused the Khutba to be read and coins to be struck in the name of Shams-ud-din Kaimurs, but a few days afterwards Firoz sent this child to follow his father Kaikobad, and Firoz himself ascended the throne of Delhi on Friday the 25th Zilhijja (December) of the same year.

"Ferishtah says that Jallal-ud-din Firoz was guilty of no further acts of cruelty after the death of the young prince, but became distinguished for his humanity and benevolence.

"A coin of this unfortunate child, struck during his nominal reign, exists at Delhi and is in the possession of Pañdit Rattan Narain, Názir of the Deputy Commissionier's Court.

"I subjoin a drawing and description of it—



*Silver.* Weight 167 grains. Unique A. H. 6

Square areas.

الامام  
المستعصم امير  
المومنين

السلطان الاعظم  
شمس الدين والدين  
ابوالمظفر كيومرث

"ضرب عدد \* \* \* \* \* وستمائة Margin

GENERAL CUNNINGHAM writes:

"I have seen this silver coin of *Shams-ud-din Kaimurs* in the possession of Pandit Ratan Náráyan. It is genuine and unique. This young Prince is mentioned by Zia-ud-din Barui by his title only: see Elliot's *Muhammadan Historians*, III, 133, 'The Sultan's child was seated on the throne, under the title of Sultán Shams-ud-din.' \* \* 'The sons of Jalál-ud-din went publicly at the head of 500 horse to the royal palace, seized upon the infant Sultán, and carried him off to their father.' Ferishta notes that Jalál-ud-din, after he had been proclaimed king 'caused the young Prince to be put to death.'"

2. *On Relics from Ancient Persia in gold, silver and copper.*—By  
GENERAL A. CUNNINGHAM, C. S. I., C. I. E.

(Abstract.)

In the year 1877, on the north bank of the Oxus, near the town of Takht-i-Kuwát, opposite Khulm and two days' journey from Kunduz, there was found a large treasure of gold and silver figures, ornaments and coins, most of which have been brought to India for sale. This paper gives a description of most of the articles found, and is illustrated with 9 plates. The coins, so far as General Cunningham has seen them, range over a period of about 300 years, from the time of Darius to that of Antiochus the Great and Euthydemus of Bactria. The gold and silver figures

also seem to belong to different ages, as some are decidedly archaic, more especially a small statuette of a king in silver which the author of the paper thinks may be as old as the time of Darius.

This paper will be published in full, with plates, in the Journal Pt. I, No. 3, for 1881.

3. *The Bon (Pon) Religion.*—By BABOO SARAT CHANDRA DÁS,  
*Deputy Inspector of Schools, Darjiling.*

(Abstract.)

This paper is a literal translation of the 8th and 11th portions of the well-known Tibetan work, *Dub-thah Selkyi Melong*, written by the Lama *Je-tsun-lossang Ohhoikyí Nyima pal Ssangpo* about 1740 A. D. It contains a brief account of the history, sacred books, doctrines and ceremonies of the Bon religion, which anciently prevailed in Tibet, before the introduction of Buddhism. Three periods of the Bon religion are distinguished, called the Jola Bon, the Khyar Bon and the Gyur Bon respectively. During the Jola period, it appears to have been a kind of simple Shamaism; in the Khyar period, it was mixed up with the Saiva doctrine of the Tirthikas; in the Gyur period, it was largely assimilated to Buddhism, which had been introduced into Tibet in the meantime.

This paper will be published in full in the Journal, Pt. I, No. 3, for 1881.

4. *The Early History of Tibet*—By BABOO SARAT CHANDRA DÁS,  
*Deputy Inspector of Schools, Darjiling.*

(Abstract.)

This paper contains an account of the earlier history of Tibet, compiled from original sources, such as the Debther-ngon-po, Chhojung, Ga-nag-gi-tsi, Ngon-gyi-yig-tshang-nying-pa, etc. It is divided into two Parts. The first part narrates the earliest history of Tibet, from 416 B. C. to 917 A. D. The second part relates its history in the Middle Ages, from 917 to 1645 A. D.

This paper will be published in full in the Journal, Pt. I, No. 3, for 1881.

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## LIBRARY.

The following additions have been made to the Library since the Meeting held in August last.

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- Calcutta. Calcutta Review,—Vol. LXXIII, No. 146, October 1881.
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- . Messenger of Mathematics,—Vol. XI, Nos. 1-3.
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- . Entomologist,—Vol. XIV, Nos. 218-219, July and August, 1881.
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- . Publishers' Circular,—Vol. XLIV, Nos. 1052-1057.
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- . The Ibis,—Vol. V, No. 19, July 1881.
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EDWARDS, H. MILNE. Leçons sur la Physiologie et l'Anatomie Comparée de l'Homme et des Animaux. Vols. X-XIV. 8vo. Paris, 1874-81.

EDALJI, SHÁPURJI. A Dictionary, Gujarátí and English. 8vo. Bombay, 1868.

FERGUSON, JAMES. Tree and Serpent Worship, or Illustrations of Mythology and Art in India in the First and Fourth Centuries after Christ. From the Sculptures of the Buddhist Topes at Sanchi and Amravati. Second Edition. 4to. London, 1873.

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- SENART, E'. Les Inscriptions de Piyadasi. Vol. I. 8vo. Paris, 1881.
- SHEBBING, REV. M. A. Hindu Tribes and Castes, as represented in Benares. Vol I. 4to. London, 1872.
- SULLY, JAMES. Illusions: a Psychological Study. 12mo. London, 1881.
- THOMSON, SIR C. WYVILLE. Report on the Scientific Results of the Voyage of H. M. S. "Challenger" during the years 1873-76; under the Command of Captain George S. Nares, R. N., F. R. S., and Captain Frank Turle Thomson, R. N. Zoology: Vols. I-II. 4to. London, 1880-81.
- TOD, LT.-COL. JAMES. Travels in Western India, embracing a visit to the Sacred Mounts of the Jains and the most Celebrated Shrines of Hindu Faith between Rajputana and the Indus; with an Account of the Ancient City of Nehrwalla. 4to. London, 1839.
- WATTS, HENRY. A Dictionary of Chemistry. Third Supplement, Part II. 8vo. London, 1881.
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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
FOR DECEMBER, 1881.

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The Monthly General Meeting of the Asiatic Society of Bengal was held on the 7th of December at 9 P. M.

The HON'BLE H. J. REYNOLDS, Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced :—

1. From the Home Department,—Oldenberg's Vinayapitakam, Vol. III.
2. From the Home Department, Forest Branch,—(1) Report of a visit to the Torrent Regions of the Hautes and Basses Alpes, and also to Mount Faron, Toulon, by E. McA. Moir,—(2) Suggestions regarding the management of the leased Forests of Busáhir in the Sutlej Valley of the Panjab, by Dr. D. Brandis.
3. From Raja Sourindro Mohun Tagore,—A set of his works in English, Sanskrit, Bengali and Hindi.
4. From the Authors,—(1) The adoption of a Prime Meridian to be common to all nations. The establishment of Standard Meridians for the Regulation of Time, by Sandford Fleming,—(2) An Address to the Fifth International Oriental Congress, 1881, by Dr. Ram Das Sen,—(3) Versuch einer Erklärung der auf einer Gemme im Besitze des Grafen S. Stroganov befindlichen Pehlewi-Inschrift, by B. Dorn,—(4) The Epoch of the Guptas, by Edward Thomas,—(5) On the Land-shells of the Island of Socotra collected by Prof. I. Bayley Balfour, Pt. II, by Lieut.-Col. H. H. Godwin-Austen,—(6) Readings from the Arian Pali, by Dr. A. F. R. Hoernle.
5. From the Superintendent, Marine Survey Department,—Chart of Curves of Equal Magnetic Variation in the Indian Ocean for 1880.
6. From the Surveyor General of India,—(1) A copy of the 5th Edition of the Map of Turkestan, and the countries between the British and Russian Dominions in Asia,—(2) Synopsis of the Results of the Opera-

tions of the Great Trigonometrical Survey of India, Vols. X, XI, XII, and XIII.

7. From the Government of Bengal,—Brief Summary of the Meteorology of Bengal, 1880.

The following Gentlemen, duly proposed by the Council at the last meeting, were ballotted for and elected Honorary Members of the Society:

1. Dr. William Wright.
2. Dr. Rudolph v. Roth.
3. Sir William Thomson.
4. Prof. Hermann L. F. Helmholtz.

The following Gentlemen, duly proposed and seconded at the last meeting, were ballotted for and elected Ordinary Members of the Society:

- R. Logan, Esq.  
J. J. Monteath Esq., M. D.

The following Gentleman is a candidate for ballot at the next meeting:

Babu Girjabhushana Mukerji, M. A., proposed by Babu Protapa Chandra Ghosha, seconded by J. Wood-Mason, Esq.

The SECRETARY reported that the following Gentlemen had intimated their desire to withdraw from the Society:

- Major M. Protheroe.  
Herr W. Joest.  
Munshi Ganga Pershad.

The following papers were read—

1. *A numerical Estimate of the Species of Animals, chiefly Land and Freshwater, hitherto recorded from British India and its Dependencies.*—By WILLIAM T. BLANFORD, F. R. S.

(Abstract.)

This paper is an attempt to obtain a rough estimate of the number of species belonging to the animal kingdom hitherto recorded in British India and its Dependencies. The marine fauna inhabiting the seas around India being very imperfectly known, Mr. Blanford has confined himself, in all the sub-kingdoms except the Vertebrata, to the land and freshwater fauna alone. Although the data obtained are very imperfect, Mr. Blanford publishes them because they lead to some very curious results. The number of recorded species in each order of the various classes is given, together with the authorities from whom the data have been collected: and from this a final table giving the number of species in each class is compiled.

On this Mr. Blanford remarks: "The figures given are, I believe, a fair approximation to the truth, and the result is one that I think should make Anglo-Indian naturalists endeavour to improve our knowledge of the fauna. It is scarcely creditable that, in a perfectly accessible country, with facilities for travelling and for living in different parts of the area unrivalled within the tropics, we should remain so ignorant of the zoology. It is ridiculous to suppose that the Indian *Coleoptera* are scarcely more numerous than the *Lepidoptera*, that the *Hymenoptera* (which very probably rival, and may excel, each of the other orders) are only between  $\frac{1}{3}$  and  $\frac{1}{2}$  as numerous, or that the *Neuroptera*, of which, Mr. McLachlan tells me, about 1000 are known from Europe, are only represented by 350 species. As to the spiders, it is no exaggeration to say that in most parts of India 108 species (which is the total number hitherto described for the whole of India) might be collected in a few days' search. It is to be hoped that the next 5 years will witness a very considerable increase in our knowledge of the fauna of India."

This paper will be printed in full in the Journal, Part II, No. 4, for 1881.

2. *Notes on an apparently undescribed Varanus from Tenasserim, and on other Reptilia and Amphibia.*—By W. T. BLANFORD, F. R. S.

(Abstract.)

This paper gives a detailed description of a *Varanus* found in Tenasserim in the neighbourhood of Tavoy, which Mr. Blanford cannot identify with any known species. It may be immediately distinguished from all other Indian forms by its peculiar nostril, situated in a single scale, by the larger scales on the upper part of the body, and especially by the scales of the nape being larger than those above the head, or those on the back. There is also a description of a cobra differing in colour and to some slight extent in structure from any Indian form known to Mr. Blanford, the colouration being remarkably similar to that in the Central Asiatic type described by Eichwald under the name of *Tomyris oxiana*. This snake was found in Gilgit where several birds and mammals belonging to Central Asiatic types occur.

The paper also contains notes on specimens of *Draco tæniopterus* found near Tavoy in Tenasserim, and on a species of *Pseudophidian*, *Ichthyophis Glutinosus*, found near Darjeeling, being the first *Pseudophidian* recorded from the Himalayas.

This paper will be published in full in the Journal, Pt. II, No. 4, for 1881.



3. *Description of a new Species of Rostellaria, from the Bay of Bengal.*—By GEOFFREY NEVILL, C. M. Z. S.

This paper contains a description of a highly interesting and very characteristic form, quite unlike any of the other seven known living species of the genus, which was dredged in deep water off Cheduba, Arrakan Coast, by Surgeon J. Armstrong, late Naturalist to the Indian Marine Survey.

It will be published in full in the Journal, Pt. II, No. 4, for 1881.

4. *Description of a new Species of the Lepidopterous genus Euripus from North Eastern India.*—By J. WOOD-MASON, Deputy Superintendent, Indian Museum, Calcutta.

This paper will be published in full in the Journal, Pt. II, No. 4. for 1881.

### LIBRARY.

The following additions have been made to the Library since the Meeting held in November last.

### TRANSACTIONS, PROCEEDINGS AND JOURNALS,

*presented by the respective Societies and Editors.*

Berlin. K. preuss. Akad der Wissenschaften, Monatsbericht, June 1881.

Bombay. Royal Asiatic Society,—Journal, Vol. X, No. 28, 1871-72.

Bordeaux. Société de Géographie Commerciale, Bulletin, No. 21, 7th November 1881.

Calcutta. Geological Survey of India,—Memoirs, Vol. XVIII, Part 2.

Dresden. Kais. Leopoldinisch—Carolinische Deutsche Akademie der Naturforscher,—Nova Acta, Vol. XLI, Parts 1-2.

Leipzig. Deutsche morgenländische Gesellschaft,—Zeitschrift, Vol. XXXV, Parts 2 and 3.

Lisbon. Sociedade de Geographia,—Boletim, Second Series, No. 6.

Colonias portuguesas em paiz Estrangeiro. VIII. Em Marrocos, pelo consul geral e encarregado de negocios José Daniel Colaço.

London. The Academy,—Nos. 494-497.

———. The Athenæum,—Nos. 2817-2820.

———. Linnean Society,—Journal, Botany, Vol. XVIII, Nos. 108-113.

No. 108. *Murray, Geo.*—On the application of the Results of Pringsheim's recent Researches on Chlorophyll to the Life of the Lichen.

No. 109. *Brown, N. E.*—On some new *Aroidæ*; with Observations on other known forms :—Part I.

No. 110. *Bentham, Geo.*—Notes on *Orchidæ*.

No. 111. *Watt, Geo.*—Notes on the Vegetation, &c., of Chumba State and

- British Lemnol; with Descriptions of new species. *Darwin, Francis*.—The Theory of the Growth of Cuttings; illustrated by observations on the Bramble, *Rubus fruticosus*.
- No. 112. *Darwin, Francis*.—On the power possessed by Leaves of placing themselves at Right Angles to the direction of Incident Light. *Bidie, William*.—Remarks on the Indian Coffee-Leaf disease. *Cooke, M. C*.—The Coffee Disease in South America. *Clarke, C. B*.—On Right-hand and Left-hand Contortion.
- No. 113. *Masters, Maxwell T*.—On the Conifers of Japan. *Clarke, C. B*.—On *Arnebia* and *Macrotomia*.
- London. Linnean Society.—Journal, Zoology, Vol. XV, Nos. 84-85.
- No. 84. *Carpenter, P. Herbert*.—On the Genus *Solanocrinus*, Goldfuss, and its Relations to recent *Comatulæ*. *Watson, Rev. Robert Boog*.—Mollusca of H. M. S. 'Challenger' Expedition.—Part VI. *Turritellidæ*.
- No. 85. *Macdonald, John Denis*.—On the Classification of *Gastropoda*. Part II. *Watson, Rev. Robert Boog*.—Mollusca of H. M. S. 'Challenger' Expedition.—Part VII.
- . ———. Transactions,—Zoology, Vol. II, Part 2.
- Collingwood, Cuthbert*.—On some new species of Nudibranchiate Mollusca from the Eastern Seas. *Lubbock, Sir John*.—On the Anatomy of Ants. *Haddon, Alfred C*.—On the Extinct Land Tortoises of Mauritius and Rodriguez.
- . ———. List of the Linnean Society, January, 1881.
- . Nature,—Vol. XXIV, Nos. 625-626; Vol. XXV, Nos. 627-628.
- . Royal Geographical Society,—Proceedings,—Vol. III, No. 9, September, 1881.
- Stewart, Lt.-Col. C. E*.—The Country of the Tekke Turkomans, and the Tejend and Murghab Rivers.
- Mozambique. Sociedade de Geographia,—Boletim, No. 5, October, 1881.
- Munich. Repertorium für Experimental-Physik, Vol. XVII, Nos. 11 and 12.
- Weber, W. and Zöllner, F*.—Elektrodynamische Widerstandsmessungen nach absolutem Maasse. *Puluj, Dr. J*.—Strahlende Elektrodenmaterie.—Neue Methode zur Bestimmung der magnetischen Declination auf Reisen nach Dom. Ragona. .
- Roma. Società degli Spettroscopisti Italiani,—Memorie, Vol. X, No. 9, September 1881.
- Fievez, Ch*.—Recherches sur l'élargissement des raies spectrales de l'hydrogène. *Fievez, Ch*.—Note sur l'analyse de la lumière de la comète de (δ) 1881. *Groneman, H. I. H*.—Recherches sur la nature de la lumière zodiacale.
- Schaffhausen. La Société Entomologique Suisse,—Bulletin, Vol. VI, No. 4.
- Simla. United Service Institution of India,—Journal, Vol. X, No. 48.
- Stockholm. Kongliga Svenska Vetenskaps-Akademien's Förhandlingar,—Öfversigt, Vols. XXXIV-XXXVII, 1877-80.

Stockholm. Kongliga Svenska Vetenskaps-Akademiens, <sup>a</sup>-Bihang, Vol. IV, Pts. 1 and 2; Vol. V, Parts 1 and 2.

———. Beskyddare Hans Maj. T. Konungen, May 1878 to May 1881.

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Zagreb. Arkeologickoga Druzstva,—Viestnik, Vol. III, No. 4.

### BOOKS AND PAMPHLETS,

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FLEMING, SANDFORD. The adoption of a Prime Meridian to be common to all nations. The establishment of Standard Meridians for the regulation of time. Read before the International Geographical Congress at Venice, September 1881. 8vo. London, 1881. Pam.

GODWIN-AUSTEN, LT.-COL. H. H. On the Land-shells of the Island of Socotra collected by Prof. I. Bayley Balfour. Part II. 8vo. London, 1881. Pam.

HOERNLE, DR. A. F. R. Readings from the Arian Páli. 16mo. Bombay, 1881. Pam.

SEN, DR. RAM DAS. An Address to the Fifth International Oriental Congress, 1881. 8vo. Calcutta, 1881. Pam.

TAGORE, SOUBINDRO MOHUN. A Brief Account of the Tagore Family. 8vo. Calcutta, 1868.

———. Short Notices of Hindu Musical Instruments. 32mo. Calcutta, 1877.

———. A few Lyrics of Owen Meredith set to Hindu Music. 8vo. Calcutta, 1877.

———. Six Principal Rágas, with a Brief View of Hindu Music. 4to. Calcutta, 1877.

———. Fifty Tunes composed and set to music. 8vo. Calcutta, 1878.

———. A Vedic Hymn. Fcp. Calcutta, 1878.

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———. Roma-Kavya, or a short sketch of Roman History, from the Earliest Days of Antiquity to the present time, in Sanskrit verse. 8vo. Calcutta, 1880.

———. Eight Tunes, composed by. 8vo. Calcutta, 1880.

**TAGORE, SOURINDEO MOHUN.** The Eight Principal Rasas of the Hindus, with Murtti and Vrindaka, or Tableaux and Dramatic Pieces illustrating their character. 4to. Calcutta, 1880.

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#### MISCELLANEOUS PRESENTATIONS.

The Indian Forester, Vol. VII, No. 2, October 1881. 8vo. Calcutta, 1881.

Report on the External Trade of Bengal with Nepal, Sikkim and Bhutan, for the year 1880-81. Fcp. Calcutta, 1881.

Report on the Administration of the Customs Department in the Bengal Presidency for the official year 1880-81. Fcp. Calcutta, 1881.

Annual Report on Emigration from the Port of Calcutta to British and Foreign Colonies for 1880-81. Fcp. Calcutta, 1881.

Brief Summary of the Meteorology of Bengal, 1880. Fcp. Calcutta, 1881.

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**MOIR, E. McA.** Report of a visit to the Torrent Regions of the Hautes and Basses Alpes, and also to Mount Faron, Toulon. Fcp. Calcutta, 1881.

**OLDENBERG, DR. H.** The Vinayapitakam, Vol. III. 8vo. London, 1881.

**BRANDIS, DR. D.** Suggestions regarding the management of the leased Forests of Busahir in the Sutlej valley of the Punjab. Fcp. Simla, 1881.

#### HOME DEPARTMENT.

Annual Report on the Civil Hospitals and Dispensaries in the Madras Presidency for the year 1880. Fcp. Madras, 1881.

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#### MADRAS GOVERNMENT.

Synopsis of the Results of the Operations of the Great Trigonometrical Survey of India, Vols. X, XI, XII and XIII. 4to. Dehra Dun, 1880.  
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    *Pringsheim*.—Recherches sur le rôle de la chlorophylle dans les végétaux.  
Göttingen. Gelehrte Anzeigen,—Nos. 41-44.  
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    ———. Beiblätter,—Vol. V, No. 10.  
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    *Bate, C. Spence*.—On the *Penæidea*. *Miers, Edward J.*—On a collection of Crustacea made by Baron Hermann-Maltzam at Goree Island, Senegambia.  
    *Smith, Edgar A.*—Remarks upon Mr. Wood-Mason's Paper "On the Discrimination of the Sexes in the Genus *Paludina*." *Carter, H. J.*—On *Spongiophaga* in *Spongilla*. *Scully, J.*—On some Mammals from Kandahar.  
    ———. Chemical News,—Vol. XLIV, Nos. 1143-1146.  
    No. 1144. *Braham, Philip*.—On Crystals produced by the Action of Metals sealed up in Carbon Disulphide.  
    ———. Entomologist,—Vol. XIV, No. 220, September 1881.  
    ———. Entomologist's Monthly Magazine,—Vol. XVIII, No. 208, September 1881.  
    *Hellins, Rev. J.*—On the variable number of moults in larvæ from the same batch of eggs.  
    ———. Journal of Botany,—Vol. X, No. 225, September 1881.  
    ———. Journal of Science,—Vol. III, No. 93, September 1881.  
    *Slater, J. W.*—On *Diptera* as Spreaders of Disease.  
    ———. London, Edinburgh and Dublin Philosophical Magazine,—Vol. XII, No. 74, September 1881.  
    *Gray, Thomas*.—On Instruments for measuring and Recording Earthquake-Motions.  
    ———. Messenger of Mathematics,—Vol. XI, No. 4, August 1881.  
    *Cox, H.*—On the distance of rainbows.  
    ———. Nineteenth Century,—No. 55, September 1881.  
    *Bevington, Louisa S.*—How to eat bread. *Laveleye, E'mile de*.—The future of gold.  
    ———. Publishers' Circular,—Vol. XLIV, Nos. 1058-1059.

London. Quarterly Journal of Pure and Applied Mathematics,—Vol: XVII, No. 68.

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No. 1509. *Carter, R. Brudenell*.—Cantor Lectures :—Colour Blindness.

Paris. Comptes Rendus,—Vol. XCIII, Nos. 15-18.

No. 15. *Avignon*.—Sur l'emploi du goudron, comme préservatif contre le Phylloxera. Note concernant l'utilisation des eaux mères des marais salants pour les bains destinés à la liquation du soufre, dans leur procédé d'extraction industrielle de ce corps. *Coggia*.—Comète découverte par M. Denning, le 4 Octobre 1881 ; observation faite à l'Observatoire de Marseille. *Lalagade, G. de*.—Sur les bruits qui se produisent dans un circuit téléphonique, par les temps d'orage. *Fung, E.*—De l'innervation du cœur et de l'action des poisons chez les Mollusques lamellibranches. *Sudour, E. and Caraven-Cachin, A.*—Empoisonnement par les graines de l'*Euphorbia lathyris* (L.), et nouvelles expériences sur leur usage thérapeutique.

No. 17. *Bell, Al. Graham*.—Sur un appareil permettant de déterminer, sans douleur pour le patient, la position d'un projectile de plomb ou d'autre métal dans le corps humain. *Laveran, A.*—De la nature parasitaire des accidents de l'impaludisme. *Letellier, A.*—Note sur les précautions à prendre pour éviter les falsifications du lait. *Duponchel*.—Note concernant l'influence du mouvement des grosses planètes dans la périodicité des taches Solaires.

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No. 4. *Janet, Paul*.—La Philosophie de la Croyance, à l'occasion d'un livre récent. *Lasègue, Ch.*—Le Braidisme. *Brunetière, F.*—La Déformation de la Langue par l'Argot, à propos de livres récents.

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# I N D E X

TO

PROCEEDINGS, ASIATIC SOCIETY OF BENGAL,

FOR 1881.

	<i>Page</i>
'Abd-ul-Kádir's Muntakhab-ul-Tawarikh, second volume of ...	152
'Abd-ur Rashid, coin of ... ..	4
Afghanistan, the Voles of ... ..	104
Ahmad (Kabiruddin), member of the Philological Committee ...	87
'Alam Shah, coins of ... ..	40
'Alá-ud-dín Mas'aud Sháh, coin of ... ..	52
Alekh, religion of ... ..	155
<i>Amblypodia arsenius</i> ... ..	143
„ <i>fulla</i> ... ..	<i>ib.</i>
Andamans, Rhopalocerous Lepidoptera from ... ..	142
Annual Meeting ... ..	21
Annual Report for 1880 ... ..	<i>ib.</i>
Apastamba Śrauta Sūtra ... ..	29
Apcar (J. G.), withdrawal of... ..	2
Arnold (H. K. W.), withdrawal of... ..	151
<i>Arrhopala amantes</i> ... ..	143
Arvicola ... ..	104
Assam during the year 1880, a list of Earthquakes recorded in ...	51
<i>Assimineæ</i> ... ..	124
Awans of the Salt Range ... ..	50
Azilises, coin of ... ..	39
Bactrian hemidrachmas ... ..	<i>ib.</i>
Ball (V.), appointed member of Council... ..	50
„ „ appointed Natural History Secretary... ..	<i>ib.</i>
„ „ appointed Treasurer ... ..	61
„ „ exhibition of stone implement of magnetic iron ore by... ..	120



	<i>Page</i>
Ball (V.), officiates as Natural History Secretary ... ..	86
„ „ on identification of Diamond Mines visited by Tavernier 2, 125	125
„ „ on the nature and use of Fire Sticks ... ..	72
„ „ on the occurrence of the Lion in Palamow ... ..	3
„ „ on the paper on Shrines of Sitákund ... ..	51
„ „ on the so-called Kharakpur Meteorite ... ..	140
„ „ presentation of Society's publications to ... ..	152
„ „ remarks on papers on inhabitants of the Nicobars ... ..	15, 110
„ „ remarks on relics from Buddha-Gaya ... ..	89
„ „ resignation of Natural History Secretaryship and Treasurership by ... ..	152
Bandow (Chr. J.), elected an Ordinary Member ... ..	151
Banerjea (K. M.), member of Philological Committee ... ..	87
Basti, coins from ... ..	50
Beames (J.), member of Philological Committee ... ..	87
Beglar, relics found by Mr. ... ..	88
Beiragurh ... ..	3
Benett (W. C.), elected an Ordinary Member ... ..	50
Bengal, early Muhammadan coins of ... ..	52
„ in 1769, map of ... ..	90
Beverley (H.), member of Finance and Library Committees ... ..	86, 87
„ „ re-elected member of Council ... ..	61
„ „ remarks on old maps of Calcutta and Bengal ... ..	90
Bhamati, completion of ... ..	27, 28
Bhaṭṭi Kavya, manuscript of the ... ..	134
Bibliotheca Indica Series, report on ... ..	27
„ „ „ works sanctioned for publication in the ... ..	64
Blanford (H. F.), member of Library and Physical Science Committees ... ..	86, 87
„ „ on a raingauge with evapometer ... ..	76
„ „ on the relation of cloud and rainfall to temperature ... ..	74
„ „ on the Van Rysseberghe meteorograph ... ..	65
Blanford (W. T.), a numerical estimate of the species of animals recorded from British India and its dependencies ... ..	170
„ „ on an apparently undescribed <i>Varanus</i> from Tenasserim, and on other <i>Reptilia</i> and <i>Amphibia</i> ... ..	171
„ „ on <i>Myospalax fuscicapillus</i> ... ..	104
„ „ on the Voles of the Himalayas, Tibet and Afghanistan ... ..	ib.
Blochmann (Henry), bust of the late ... ..	152

	<i>Page</i>
<i>Bombax</i> ... ..	72
Bomford (Dr. G.), elected an Ordinary Member ...	38
Brandis (Dr. G.), member of Natural History Committee ...	87
Brihaddevatá ... ..	29
British India, numerical estimate of animals recorded from ...	170
Buckland (C. E.), withdrawal of ... ..	103
Buddha Gaya, relics from ... ..	88
Buddhist sculpture ... ..	112
Building, report on ... ..	26
Bulandshahr, Buddhist sculpture found at ...	112
„ curiosities found at ... ..	113, 120, 139
Calcutta in 1756 and 1757, sketch and plan of ...	90
Cappel (A. J. L.), member of Physical Science Committee ...	87
Carter (P. J.), elected an Ordinary Member ...	38
Cerberus, origin of myth about ... ..	91
<i>Cerithidæ</i> ... ..	124
Channing (F. C.), elected an Ordinary Member ...	50
Charaka ... ..	29
Charibael, coins of ... ..	51
Chatterji (Bhyrub Chunder), elected an Ordinary Member ...	50
Cheduba, <i>rostellaria</i> from off ... ..	171
Chittagong, shrines of Sitákund in ... ..	51
Chunder (Sreenath), elected an Ordinary Member ...	50
Cockburn (John), elected an Ordinary Member ...	86
Cockerell (H. A.), withdrawal of ... ..	2
Coin Cabinet, report on ... ..	26
Coins 4, 6, 26, 39, 40, 41, 49, 50, 51, 52, 64, 69, 103, 104, 119, 134, 139 157, 158	
„ Committee ... ..	88
Colvin (B. W.), withdrawal of ... ..	64
Committees, appointment of ... ..	86
Cook (Capt L. A. C.), elected an Ordinary Member ...	50
Council, abstract of proceedings of ... ..	32
<i>Croton oblongifolium</i> ... ..	72
“Cry of tin” ... ..	42
Cunningham (Dr. D. D.), member of Library and Natural History Committees ... ..	86, 87
Cunningham (Major-Gen. A.), member of Philological and Coins Committees ... ..	87, 88
„ note on Coin of Shams-ud-din Kaimurs ...	158
„ on antiquities exhibited ... ..	138
„ on relics from ancient Persia ... ..	158

	Page
<i>Cyrestis cocles</i> ... ..	142
„ <i>horatius</i> ... ..	<i>ib.</i>
„ <i>thyodamas</i> ... ..	<i>ib.</i>
Dás (Sarat Chandra), on the Bon (Pon) religion ... ..	159
„ „ on the early history of Tibet ... ..	<i>ib.</i>
Dehra Dun, outburst of sun-spots observed at ... ..	153
Delmerick (J. G.), on a silver coin of Shams-ud-din Kaimurs ... ..	157
Deoghar, on the temples of ... ..	139
Diamond mines visited by Tavernier ... ..	2, 125
Dichroite or Iolite ... ..	89
Dobson (Dr. G. E.), withdrawal of ... ..	134
<i>Dodona deodata</i> ... ..	122
„ <i>egeon</i> ... ..	123
„ <i>longicaudata</i> ... ..	121
Donglas (J. C.), exhibition of telephone by ... ..	39
„ on the phenomenon commonly called the “Cry of Tin”... ..	42
„ on the standing of animals, the perching of birds and the walking pace of man ... ..	53
„ resignation of Treasurership by ... ..	64
<i>Draco tæniopterus</i> ... ..	171
Dutt (Jogesh Chunder), withdrawal of ... ..	134
Earthquakes in Assam during 1880, a list of ... ..	51
Eclipse of sun, May 1882, predictions for ... ..	88
Eden (Sir Ashley), elected an Ordinary Member ... ..	50
„ „ elected President ... ..	61
Election of members ... ..	88, 50, 64, 86, 120, 134, 151, 170
Eliot (J.), appointed Treasurer ... ..	152
„ „ elected member of Council ... ..	61
„ „ elected Trustee of the Indian Museum ... ..	86
„ „ member of Finance, Library and Physical Science Committees ... ..	86, 87, 88
„ „ officiates as General Secretary ... ..	103
Estimate for income and expenditure ... ..	24
<i>Euripus</i> ... ..	77, 172
Evapometer, raingauge with ... ..	76
<i>Fairbankia</i> ... ..	124
Farrukhzád, coin of ... ..	4
Fedden (F.), member of Physical Science Committee ... ..	88
„ „ remarks on Indo-Malayan mollusca ... ..	124
Feistmantel (Dr. O.), member of Library and Natural History Committees ... ..	86, 87

	<i>Page</i>
Feistmantel (Dr. O.), sketch of the history of the fossils of the Indian Gondwana System by ...	123
Finance Committee ... ..	86
„ report on ... ..	23
Fire-sticks ... ..	72
Firukh Shah (Prince Mahomed), elected an Ordinary Member ...	120
Fossils of the Indian Gondwana System, history of the ...	123
Gani-coulour ... ..	4
Gazni Sultans, coins of ... ..	157
Gennoe (T. A. M.), memorandum on coins by ... ..	52
Ghiyaz-ud-dín 'Iwaz, coin of ... ..	87
Ghoshā (P. C.), member of Library and Philological Committees ..	61
„ „ re-elected member of Council ... ..	88
Gibbs (Hon'ble J.), member of Coins Committee ... ..	52
„ „ remarks on Pathan and Moghul coins ... ..	124
<i>Glaucomya</i> ... ..	27, 28
Gobhiliya Grihya Sūtra, completion of ... ..	6
Gobind Shāhi rupees ... ..	123
Gondwana System, history of the fossils of the Indian ..	50
Gossain (Hem Chunder), elected an Ordinary Member ... ..	87
Grierson (G. A.), member of Philological Committee ... ..	52
„ „ on conjugation of verbs substantive in Eastern Hindi ... ..	87
Growse (F. S.), member of Philological Committee ... ..	112
„ „ on a photograph of a Buddhist sculpture found at Bulandshahr ... ..	120
„ „ on a seal of baked clay ... ..	113, 120
„ „ on curiosities found at Bulandshahr ... ..	50
Guha (Peary Mohun), elected an Ordinary Member ... ..	151
„ „ election cancelled ... ..	39
Gupta coins ... ..	124
<i>Helicidæ</i> ... ..	151
Helmholtz (Prof. H. L. F.), recommended as Honorary Member ..	170
„ „ elected an Honorary Member ... ..	153
Hennessey (J. B. N.), on an outburst of sun-spots ... ..	143
<i>Hesperia divodasa</i> ... ..	ib.
„ <i>praba</i> ... ..	ib.
„ <i>sala</i> ... ..	104
Himalayas, voles of the ... ..	51
Himyaritic coins ... ..	52
Hindi, comparative table of the conjugations of the verbs substantive in Eastern ... ..	

	<i>Page</i>
Hindu Coins ... ..	41
Hoernle (Dr. A. F. R.), exhibition of coins sent by Mr. H. Rivett-Carnac ... ..	39
"    "    exhibition of Hindu coins found at Sárnáth	41
"    "    exhibition of inscriptions from Chewora ...	42
"    "    exhibition of relics found by Mr. Beglar at Buddha Gaya ... ..	88
"    "    exhibition of 12 coins of the later Delhi Emperors ... ..	40
"    "    on a new find of early Muhammadan coins of Bengal ... ..	52
"    "    on copper coins and antiquities from Khrakote ... ..	69
"    "    on the Sue Vihára copper-plate ... ..	139
"    "    re-elected Philological Secretary ... ..	61
Holnnette (Mr.), coins presented by ... ..	41, 49
Honorary Members, election of ... ..	151, 170
Hume (A. O.), member of Natural History Committee ... ..	87
Husain Sháh ... ..	41
Ibrahim, coin of ... ..	4
<i>Ichthyophis glutinosus</i> ... ..	171
Imadpur, excavation of mound near ... ..	98
Indian Museum, presentations made to the ... ..	22
"    "    trustees of the ... ..	ib.
Indo-Scythic coins ... ..	71
Inscriptions ... ..	42, 134, 139
Iolite or Dichroite ... ..	89
Isábah, progress of ... ..	27
<i>Ismene badra</i> ... ..	143
" <i>exclamationis</i> ... ..	ib.
" <i>harisa</i> ... ..	ib.
" <i>malayana</i> ... ..	ib.
Jalálat-ud-dín, coins of ... ..	52
Janjúás ... ..	50
Jarrett (Major H. S.), member of Philological Committee... ..	87
Jenkins (Capt. T. M.), elected an Ordinary Member ... ..	38
Jods of Baber, identity of Awans of Salt Range with the ... ..	50
Joest (A.), withdrawal of ... ..	170
Johnstone (Lieut.-Col. J. W. H.), on the Awans of the Salt Range	50
Jowhri Dih, excavation of mound called ... ..	98

	<i>Page</i>
Kaimurs, coin of Shams-ud-din ... ..	157
Karibâ-el Wattâr Yehan'am ... ..	52
Kathâ Sarit Sâgara ... ..	27, 28
Keene (H. G.), on the revenues of the Mughul Empire ...	91
Kerberos, origin of the myth about ... ..	<i>ib.</i>
Kharakpur meteorite ... ..	140
Khokhrakote, coins, &c., from ... ..	69
King (Dr. G.), member of Natural History Committee ...	87
King (L.), elected an Ordinary Member ... ..	50
Kumâra Gupta, coins of ... ..	39
Kumbhupatias, tenets, habits, customs and places of residence of...	154
Lahore, coins struck by Gazni Sultans in ... ..	4
Lalita Vistara ... ..	29
Lambe (W.), withdrawal of ... ..	39
Lâmiyyet-el-Arab ... ..	152
<i>Lampides malaya</i> ... ..	143
Latif (Nawab Abdul), member of the Philological Committee ...	87
Laughlin (R. C.), elected an Ordinary Member ... ..	38
Lee (J. B.), elected an Ordinary Member ... ..	50
Lees (R. O.), election cancelled ... ..	151
Lepidoptera ... ..	57
Lewis (Dr. T. R.), member of Natural History Committee ...	87
Library, additions to the ... 15, 44, 58, 77, 99, 114, 125, 144, 160, 172	
„ Committee ... ..	86
„ report on the ... ..	25
Lincke (J. E.), on the excavation of a mound called Jowhri Di ...	98
Lion in Palamow, occurrence of the ... ..	3
Logan (R.), elected an Ordinary Member ... ..	170
London Agency, report on the ... ..	24
Lyall (C. J.), member of Philological Committee ... ..	87
Lydekker (R.), member of Natural History Committee ...	<i>ib.</i>
M'Cann (Dr. H. W.), appointed Honorary Secretary and member of Council ... ..	86
„ „ remarks on paper on outburst of sun-spots ...	154
MacGregor (W.), receipt of paper entitled "The Electric Telegraph and Natural History," by ... ..	125
Maghâzî el Wâqidî ... ..	29
Magnetic iron ore, stone implement of ... ..	120
Maḥmūd Shâh ... ..	41
Maitráyani Samhitâ ... ..	92
Marshall (Capt. G. F. L.), member of Natural History Committee	87

	<i>Page</i>
<b>Martin (Mr.)</b> , inscriptions sent by ... ..	
<b>Masa'ud I</b> , coins of ... ..	4
<b>Maudúd</b> , coin of ... ..	<i>ib.</i>
<b>Medlicott (H. B.)</b> , elected member of Council...	61
"    "    member of Finance, Library and Physical Science Committees ... ..	86, 87
"    "    vote of thanks to ... ..	62
<b>Meeting</b> , monthly general ... 1, 37, 49, 61, 85, 103, 119, 133, 149, 169	
<b>Melampus</b> ... ..	124
<b>Mímánsá Darśana</b> , progress of ... ..	28
<b>Mitra (Dr. R. L.)</b> , member of the Finance, Library, Philological, and Coins Committees ... ..	86, 87, 88
"    "    on a manuscript of the Bhatti Kavya ... ..	134
"    "    on coins sent by Rájá Udayapratápa Siñha ... ..	41
"    "    on inscriptions from Chewora ... ..	42
"    "    on the origin of the myth about Kerberos ... ..	91
"    "    on the temples of Deoghar ... ..	139
"    "    re-elected Vice-President ... ..	61
<b>Mitra (Trailokyanath)</b> , elected an Ordinary Member...	50
"    "    election cancelled ... ..	151
<b>Molloy (Major E.)</b> , elected an Ordinary Member ... ..	86
<b>Mollusca</b> of the Indo-Malayan fauna ... ..	123
<b>Monteath (J. J.)</b> , elected an Ordinary Member ... ..	170
<b>Morá Sháhi</b> rupees ... ..	7
<b>Mughal Empire</b> , revenues of the ... ..	91, 121
<b>Mughis-ud-dín Yuzbak</b> , coins of ... ..	52
<b>Muhammadan</b> coins of Bengal, early ... ..	<i>ib.</i>
<b>Muhammad Farrukh Sir</b> , coin of ... ..	40
<b>Muhammad Shah</b> , coin of ... ..	<i>ib.</i>
<b>Mukhopadhyaya (Babu Mohendra Chandra)</b> , appointed temporarily as copyist ... ..	86
<b>Muntakhab-ul-Tawarikh</b> , second volume of ... ..	152
<b>Myospalax fuscicapillus</b> ... ..	104
<b>Nának Sháhi</b> rupees ... ..	6
<b>Naqáid</b> of el Ferázdaq and Jerir ... ..	65
<b>Násir-ud-dín Mahmúd Sháh</b> , coins of ... ..	52
<b>Natural History Committee</b> ...	87
<b>Neptis jumba</b> ... ..	143
<b>Nevill G.</b> , member of Natural History Committee ... ..	87
on a new species of <i>Rostellaria</i> ... ..	171
on mollusca belonging to the Indo-Malayan fauna ... ..	123

	<i>Page</i>
Nicéville (L. de), and Wood-Mason (J.), list of diurnal lepidoptera inhabiting the Nicobars...	57
„ and Wood-Mason (J.), on rhopalocerous lepidoptera from the Andamans ...	142
„ elected an Ordinary Member ...	151
„ on butterflies taken in Sikkim ...	77
„ on new species of genus <i>Dodona</i> ...	121
Nicobars, on the inhabitants of the ...	7, 104
Nirukta ...	29
Nya Doomka, coins found at ...	40, 60
Palamow, occurrence of the lion in ...	3
Pandit (Babu Prannath), member of Library and Philological Committees ...	86, 87
<i>Papilio læstrigonum</i> ...	<i>ib.</i>
„ <i>prexaspes</i> ...	<i>ib.</i>
„ <i>rhodifer</i> ...	143
Parāsara Mādhava Smṛiti ...	64
Patanjali, Yoga Sūtra of ...	29
Peal (S. E.), member of Natural History Committee ...	87
Pedler (A.), re-elected Honorary Secretary ...	61
„ resignation of Honorary Secretaryship by ...	86
„ resignation of Trusteeship of Indian Museum by ...	<i>ib.</i>
PentHEMA ...	77
Percival (H. M.), elected an Ordinary Member...	151
Pershad (Durga), on discovery of coins at Khokhrakote ...	69
Pershad (Ganga), withdrawal of ...	170
Persia, relics from ancient ...	158
Philological Committee ...	87
Physical Science Committee ...	<i>ib.</i>
<i>Pirenella</i> ...	124
<i>Plesioneura alyos</i> ...	143
„ <i>dan</i> ...	<i>ib.</i>
„ <i>leucocera</i> ...	<i>ib.</i>
„ <i>paralysos</i> ...	<i>ib.</i>
Prākṛita Lakṣhaṇa ...	27, 28
Presentations ... 1, 37, 49, 63, 85, 103, 119, 133, 149, 169	
Prideaux (Major W. F.), elected an Ordinary Member ...	88
„ member of Coins Committee ...	88
„ on the coins of Chāribael ...	51
Prithi Rāja Rāsau, progress of ...	28
Protheroe (Major M.), withdrawal of ...	170



	<i>Page</i>
<i>Pseudophidian</i> ... ..	171
Publications, report on... ..	25
Ramulkota ... ..	125
Raolconda... ..	2, 125
Raingauge with evapometer ... ..	76
Rangoon (Bishop of), withdrawal of ... ..	64
Reynolds (Hon. H. J.), elected an Ordinary Member... ..	50
" elected Vice-President... ..	61
Rhopaloceros lepidoptera from the Andamans ... ..	142
Rissoid shell... ..	124
Rivett-Carnac (H.), member of Philological and Coins Committees	87, 88
Riziah, coins of ... ..	52
Rodgers (C. J.), on a find of coins struck by Gazni Sultans in Lahore ... ..	4
" on coins of the Sikhs ... ..	6
Roepstorff (F. A. de), on the inhabitants of the Nicobars ... ..	7, 104
<i>Rostellaria</i> , new species of ... ..	171
Roth (Dr. R. v.), recommended as Honorary Member ... ..	151
" elected an Honorary Member ... ..	170
Schwendler (L.), member of Natural History and Physical Science Committees ... ..	87
" re-elected member of Council ... ..	61
Sceonce (Col. J.), appointed auditor ... ..	37
Secretary's Office, report on ... ..	26
Sen (Adharlal), on the shrines of Sitákund in Chittagong ... ..	51
Shams-ud-din Altamsh, coins of ... ..	52
Shams-ud-din Kaimurs, coin of ... ..	157
Sharqi, coin of Sultan Ibrahim Sháh ... ..	40
Shombengs ... ..	7, 105
Shopland (E. R.), elected an Ordinary Member ... ..	50
Sikhs, coins of the ... ..	6
Sikkim, on butterflies taken in ... ..	77
Sircar (Dr. Mohendralala), member of Library and Philological Committees ... ..	87
Sitákund, shrines of ... ..	51
<i>Smilax</i> ... ..	73
Smith (Dr. D. B.), withdrawal of ... ..	151
Societies, &c., with which publications have been exchanged ... ..	30
Sophytes, coin of ... ..	104
Soumelpore ... ..	2
Spindle-whorls ... ..	72

	<i>Page</i>
<i>Stenothyra</i> ...	124
Stokes (Hon. Whitley), member of Philological Committee	87
Sue Vihāra copper-plate	139
Sunderbuns in 1724, map of	89
Sun, predictions for eclipse of	88
Sun-spots, outburst of	153
Susruta	65
Ṭabaqāt-i-Nāṣirī, progress of	27
<i>Tagiades bhagava</i>	143
Tarikh-ul-Ḳhulfa	27, 28
Tavernier, diamond mines visited by	2
Tawney (C. H.), exhibition of a rare coin of Sophytes	104
"    member of Library, Philological and Coins	
Committees	86, 87, 88
"    re-elected Vice-President	61
"    remarks on fire-sticks exhibited by Mr. Ball	74
Taylor (Com. A. D.), member of Physical Science Committee	88
<i>Telegonus acroleucus</i>	143
" <i>thrax</i>	<i>ib.</i>
" <i>thyrsis</i>	<i>ib.</i>
Temperature, the relation of cloud and rainfall to	74
Tenasserim, an apparently undescribed <i>Varanus</i> from...	171
Tennant (Col. J. F.), member of Library and Physical Science Com-	
mittee	86, 88
"    on eclipse of the sun, May 1882	88
"    photographs of Tierra-del-Fuego savages for-	
warded by	152
Thakur (Dijendronath), member of Philological Committee	87
"    withdrawal of	134
<i>Theora</i>	124
Thibaut (Dr. G.), member of Philological Committee	87
Thomas (Edward), on the revenues of the Mughal Empire in	
India	121
Thomson (Sir Wm.), recommended as Honorary Member	151
"    elected an Honorary Member	170
Tibet, voles of	104
Tierra-del-Fuego savages, photographs of	152
Tin, the cry of	42
<i>Tomyris oxiana</i>	171
Treasure Trove Act, coins acquired under the	50, 64, 134
<i>Tympanotomus fluviatilis</i>	124

	P
Van Rysselberghe Meteorograph ... ..	
<i>Varanus</i> from Tenasserim, an apparently undescribed ...	1
Váyu Purána, progress of ... ..	
Vishnu Smṛiti ... ..	
Voles ( <i>Arvicola</i> )... ..	1
Waldie (Dr.), re-elected member of Council ... ..	
Walker (Major-Gen. J. T.), member of Physical Science Committee ... ..	
Webb (W. T.), cancels resignation... ..	
Westland (J.), appointed auditor ... ..	
„ elected member of Council ... ..	
„ exhibition of old maps of Calcutta and Bengal ...	
„ member of Finance Committee ... ..	
„ remarks on origin of Kerberos ... ..	
Wood-Mason (J.), and Nicéville (L. de), list of diurnal lepidoptera inhabiting the Nicobar Islands ...	5
„ and Nicéville (L. de), on rhopaloceros lepidoptera from the Andamans ...	14
„ on a new species of <i>Euripus</i> ... ..	17
„ on insects belonging to the genera <i>Euripus</i> and <i>Penthema</i> ... ..	7
„ re-elected Natural History Secretary ...	6
„ resumes Natural History Secretaryship ...	15
Wright (Dr. Wm.), recommended as Honorary Member ... ..	15
„ elected an Honorary Member ... ..	17
Yoga Sûtra of Patanjali ... ..	2
Zoilos, coins of ... ..	3

[APPENDIX.]

LIST OF MEMBERS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
ON THE 31ST DECEMBER, 1880.

## LIST OF ORDINARY MEMBERS.

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R. = Resident. N. R. = Non-Resident. N. S. = Non-Subscribing.  
L. M. = Life Members. F. M. = Foreign Members.  
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N. B.—Members who have changed their residence since this list was drawn up, are requested to give intimation of such a change to the *Secretaries*, in order that the necessary alteration may be made in the subsequent edition. Errors or omissions in the following list should also be communicated to the *Secretaries*.

Members who are about to leave India and do not intend to return, are particularly requested to notify to the *Secretaries*, whether it be their desire to continue as members of the Society; otherwise, in accordance with Rule 40 of the Bye-laws, their names will be removed from the list at the expiration of three years from the time of their leaving India.

Date of Election.		
1860 Dec. 5.	R.	Abdul-Latif, Khán Bahádur, Nawab. <i>Calcutta</i> .
1868 Sept. 2.	N.S.	Adam, R. M., Depy. Commissioner, Salt Revenue. <i>Europe</i> .
1880 Dec. 1.	N.R.	Ahmad, Maulawi Dilawar Hasein. <i>Brahmanbariah</i> .
1860 July 4.	N.R.	Ahmad Khán Bahádur, Sayyid, c. s. i. <i>Aligarh</i> .
1872 April 3.	N.R.	Ahsan-ullah, Nawáb. <i>Dacca</i> .
1860 April 4.	N.R.	Aitchison, J. E. T., M. D., Surgeon-Major, 29th N. I. <i>Pewar Khotel</i> .
1871 June 7.	N.R.	Alexander, J. W., Mayo College. <i>Ajmere, Rajpootana</i> .
1878 Mar. 6.	N.R.	Allen, G. W., c. i. e., <i>Pioneer Press, Allahabad</i> .
1874 June 3.	N.S.	Amír Ali, Sayyid, Barrister at Law. <i>Europe</i> .
1865 Jan. 11.	R.	Anderson, John, M. D., F. R. S., F. L. S., Superintendent, Indian Museum. <i>Calcutta</i> .
1875 June 2.	R.	Apcar, J. G., Barrister at Law. <i>Calcutta</i> .
1875 Feb. 3.	N.R.	Armstrong, J., Surgeon, Beng. Army. Marine Survey Department.
1877 June 6.	N.R.	Arnold, Henry Kerchever Walter. <i>Bombay</i> .
1877 July 4.	R.	Ashgar Alí Khán, Nawáb Diler Jang Bahadúr, c. s. i. <i>Calcutta</i> .
1871 Sept. 6	N.R.	Atkinson, Edwin Felix Thomas, B. A., c. s., Offg. Acct. General, N. W. P. <i>Allahabad</i> .
1869 Feb. 3.	N.R.	Attar Singh Bahádur, Sirdár, c. i. e., M. U. F., Chief of Bhadour. <i>Ludiana</i> .
1870 Feb. 2.	N.R.	Baden-Powell, Baden Henry, c. s., Conservator of Forests. <i>Lahore</i> .
1873 Aug. 6.	N.R.	Badgley, Major William Francis, s. c., Offg. Deputy Superintendent of Surveys. <i>Shillong</i> .

Date of Election.		
1862 Feb. 5.	N.R.	Baisák, Gaurdás, Depy. Magistrate. <i>Maldah.</i>
1859 Aug. 3.	R.	Balaichand Siñha. <i>Calcutta.</i>
1865 Nov. 7.	R.	Ball, Valentine, M. A., F. G. S., Geol. Survey of India. <i>Geological Survey Office, Calcutta.</i>
1860 Nov. 1.	R.	Banerjea, Rev. Kristno Mohun, LL. D. <i>Calcutta.</i>
1878 July 3.	N.S.	Barbe, H. L. St., c. s. <i>Europe.</i>
1869 Dec. 1.	L.M.	Barker, R. A., M. D., Civil Surgeon. <i>Bogra.</i>
1879 Aug. 28	N.R.	Barkley, D. G., M. A., c. s., Offg. Commissioner. <i>Lahore.</i>
1860 July 4.	R.	Batten, George Henry Maxwell, c. s., Barrister at Law. <i>Calcutta.</i>
1859 May 4.	L.M.	Bayley, The Hon. Sir Edward Clive, B. C. S., K. C. S. I., C. I. E. <i>Europe.</i>
1878 June 5.	N.R.	Bayley, C. S., c. s., Asst. Secretary to the Chief Com- missioner of Assam. <i>Shillong.</i>
1873 Feb. 5.	R.	Bayne, R. R., M. R. I. B. A., Draughtsman, Chief Engineer's Office, E. I. Railway. <i>Calcutta.</i>
1864 Sept. 7.	N.R.	Beames, John, B. C. S., Offg. Commissioner. <i>Burdwan.</i>
1878 Sept. 25.	N.R.	Beighton, T. D., c. s., Offg. Judge. <i>Rangpur.</i>
1862 Oct. 8.	N.R.	Bernard, Charles Edward, c. s., Offg. Chief Com- missioner. <i>British Burmah.</i>
1872 Aug. 7.	R.	Beverley, Henry, M. A., c. s., District and Sessions Judge, 24-Pergunnahs and Hughli. <i>Calcutta.</i>
1876 Nov. 15.	N.R.	Beveridge, Henry, c. s., District and Sessions Judge. <i>Bankipur.</i>
1878 Oct. 4.	N.R.	Bhakta, Krishna Gopal. <i>Buddungunge.</i>
1879 Mar. 5.	N.R.	Biddulph, Major J., B. S. C., Officer on special duty. <i>Gilgit, Kashmir.</i>
1875 July 7.	N.R.	Black, F. C., Asst. Engineer. <i>Hamirpur, N. W. P.</i>
1873 Dec. 3.	R.	Blackburn, J., Manager, Oriental Gas Company. <i>Calcutta.</i>
1857 Mar. 4.	L.M.	Blanford, H. F., A. R. S. M., F. R. S., F. G. S., Mete- orological Reporter, Govt. of India. <i>Calcutta.</i>
1859 Aug. 3.	F.M.	Blanford, W. T., A. R. S. M., F. R. S., F. G. S., Depy. Supdt., Geological Survey of India. <i>Europe.</i>
1873 April 2.	N.R.	Blissett, T., Superintendent, Telegraph Stores. <i>Nagpur.</i>
1879 Aug. 28.	R.	Blyth, W. D., B. A., c. s., Offg. Joint Magistrate and Depy. Collector, 24-Pergunnahs. <i>Calcutta.</i>
1880 Nov. 3.	N.R.	Bose, Pramatha Nath, B. Sc., F. G. S., Geological Survey of India. <i>Dhar, C. I.</i>
1877 May 2.	R.	Bourdillon, James Austin, c. s., Inspector General of Registration. <i>Calcutta.</i>
1876 Nov. 15.	N.R.	Bowie, Major M. M., Depy. Commissioner. <i>Nagpur.</i>
1868 Jan. 15.	N.S.	Boxwell, John, c. s., Offg. Deputy Commissioner. <i>Europe.</i>
1876 May 4.	N.R.	Bradshaw, Surgeon-Major A. F., Surgeon to the Commander-in-Chief. <i>Simla.</i>
1860 Mar. 7.	R.	Brandis, Dietrich, PH. D., F. L. S., F. R. S., Inspector- General of Forests. <i>Calcutta.</i>

Date of Election.		
1880 Aug. 4.	N.R.	Brown, J. A. <i>Benares.</i>
1879 Jan. 8.	R.	Browne, J. F., C. S., M. B. A. S., Offg. District and Sessions Judge, 24-Pergunnahs. <i>Calcutta.</i>
1879 Mar. 5.	R.	Buckland, C. E., C. S., Magistrate. <i>Howrah.</i>
1879 April 2.	R.	Calcutta, The Rt. Rev., the Lord Bishop of. <i>Calcutta.</i>
1869 Jan. 20.	N.R.	Cadell, Alan, B. A., C. S., Settlement Officer. <i>Banda.</i>
1873 Mar. 5.	R.	Cappel, A. J. L., Offg. Director General of Telegraphs. <i>Calcutta.</i>
1880 Mar. 3.	N.R.	Carlisle, A. C., Archæological Survey of India. <i>Mirzapur.</i>
1876 Nov. 15.	R.	Cayley, Surgeon-Major H., Surgeon, Mayo Native Hospital. <i>Calcutta.</i>
1875 April 4.	R.	Chambers, Dr. E. W. <i>Calcutta.</i>
1879 Nov. 5.	N.S.	Charles, T. E., M. D., F. R. C. P. <i>Europe.</i>
1880 Jan. 7.	R.	Chaudhuri, Govinda Kumara. <i>Calcutta.</i>
1861 Mar. 1.	N.R.	Chaudhuri, Harachandra, Zamindar. <i>Sherpur, Maimansingh.</i>
1880 Nov. 3.	N.R.	Chaudhuri, Khirode Chandra Roy. <i>Jessore.</i>
1874 Aug. 5.	N.R.	Chennell, A. W., Asst. Surveyor, Survey Department. <i>Shillong.</i>
1877 Aug. 30.	N.S.	Clarke, Capt. Henry Wilberforce, B. E., Depy. Consulting Engr., Govt. of India, for Guaranteed Railways. <i>Europe.</i>
1878 Feb. 6.	N.S.	Clarke, Colonel Sir A., B. E., K. C. M. G., C. B., C. I. E. <i>Europe.</i>
1880 Aug. 26.	F.M.	Clerk, Lieut.-Colonel Malcolm G. <i>Europe.</i>
1880 July 7.	R.	Coates, J. M., M. D. <i>Calcutta.</i>
1878 Mar. 6.	R.	Cockerell, H. A., C. S. <i>Calcutta.</i>
1877 Mar. 7.	R.	Colvin, The Hon. Bazett Wetenhall, C. S., Member of the Governor-General's Council. <i>Calcutta.</i>
1874 Nov. 4.	N.R.	Constable, Archibald, Personal Asst. to Chief Engineer, Railway Dept. <i>Lucknow.</i>
1876 Mar. 1.	R.	Crawford, James, B. A., C. S., Barrister at Law, Registrar, High Court. <i>Calcutta.</i>
1877 June 6.	R.	Croft, A. W., M. A., Director of Public Instruction. <i>Calcutta.</i>
1874 Mar. 4.	N.R.	Crombie, Alexander, M. D., Civil Surgeon. <i>Simla.</i>
1877 Feb. 7.	N.R.	Cooke, William, C. S. <i>Awagarh, N. W. P.</i>
1873 Aug. 6.	R.	Cunningham, David Douglas, M. B., Surgeon-General of the Indian Medical Department. <i>Calcutta.</i>
1847 June 2.	F.M.	Dalton, Major-General Edward Tuite, C. S. I., S. C. (retired). Queen Anne's Mansions, St. James's Park, S. W. <i>London.</i>
1873 Dec. 3.	N.R.	Dames, Mansel Longworth, C. S., Asst. Commissioner. <i>Rajanpur, Panjab.</i>
1877 June 6.	N.R.	Darbhanga, Mahārājā of. <i>Darbhanga.</i>
1865 June 7.	N.R.	Dās, Rāja Jaykishan, Bahādur, C. S. I. <i>Bijnor.</i>

Date of Election.		
1879 April 2.	N.R.	Dás, Rám Saran, M. A., Grant <i>Ramsarandaspúr</i> , near <i>Burragaon, Fyzabad, Oudh.</i>
1869 April 7.	F.M.	Day, Dr. Francis, F. L. S., F. Z. S. <i>Europe.</i>
1856 June 4.	N.R.	DeBourbel, Lieut.-Col Raoul, B. E. <i>Lucknow.</i>
1859 Oct. 6.	N.R.	Delmerick, J. G., Extra Asst. Commissioner. <i>Amballa City.</i>
1862 May 7.	N.R.	Dhanapati Singh Dughar, Raí Bahádur. <i>Azamganj.</i>
1853 Sept. 7.	N.S.	Dickens, Major-General Craven Hildesley, B. A., C. S. I. <i>Europe.</i>
1870 May 4.	F.M.	Dobson, G. E., B. A., M. B., F. L. S., <i>Royal Victoria Hospital. Netley. Southampton.</i>
1875 Mar. 3.	N.R.	Dodgson, Walter. <i>Rangpur.</i>
1878 May 2.	N.R.	Donaldson, P., Superintendent of the Jail. <i>Buxar.</i>
1875 Mar. 3.	R.	Douglas, J., Supdt. of Telegraphs, Check Office. <i>Calcutta.</i>
1880 June 2.	N.R.	Doxey, The Rev. J. S. <i>Multan.</i>
1879 Feb. 5.	N.R.	Duthie, J. F., Superintendent, Govt. Botanical Gardens. <i>Saharunpore.</i>
1873 Aug. 6.	R.	Dutt, Jogesh Chunder. <i>Calcutta.</i>
1877 Aug. 30.	N.R.	Dutt, Kedarnath, Personal Asst. to the Rajshahye Commissioner. <i>Rampore Bauleah.</i>
1873 April 2.	R.	Dutt, Umesh Chunder. <i>Calcutta.</i>
1870 Mar. 8.	L.M.	Edinburgh, H. R. H. The Duke of. <i>Europe.</i>
1863 May 6.	N.R.	Edgar, John Ware, c. s., c. s. I., Offg. Commissioner. <i>Dhaka. Champaran.</i>
1879 Mar. 5.	R.	Eetvelde, E. van, Consul General for Belgium. <i>Calcutta.</i>
1874 Dec. 2.	N.R.	Egerton, The Hon. Robert Eyles, c. s., K. C. S. I., C. I. E., Lieut.-Governor of the Panjab. <i>Lahore.</i>
1880 April 7.	N.R.	Elias, Ney. <i>Leh, Kashmir.</i>
1871 Dec. 2.	R.	Eliot, J., M. A., Meteorological Reporter to Govt. of Bengal. <i>Calcutta.</i>
1871 Oct. 4.	N.R.	Evezard, Major-General G. E. <i>Deesa, Gujarat.</i>
1859 Dec. 7.	R.	Fath Ali, Maulawí. <i>Calcutta.</i>
1863 Jan. 15.	N.R.	Fedden, Francis, Asst., Geological Survey of India.
1876 Jan. 5.	R.	Feistmantel, Ottokar, M. D., Palæontologist, Geological Survey of India. <i>Calcutta.</i>
1880 April 7.	N.R.	Fiddian, W., M. A., c. s. <i>Kattak.</i>
1879 July 2.	N.R.	Finucane, M., c. s., Joint Magistrate. <i>Gaya.</i>
1869 Sept. 1.	N.R.	Fisher, John Hadden, c. s., Offg. Collector. <i>Mirath.</i>
1872 Dec. 4.	N.R.	Forbes, Major John Greenlaw, B. E., Supdg. Engineer, N. W. P. & Oudh Irrigation Branch. <i>Lucknow.</i>
1876 July 5.	N.R.	Foulkes, The Rev. Thos., F. L. S., M. B. A. S., F. B. G. S., Chaplain. <i>Bangalore.</i>
1869 Sept. 1.	N.R.	Fryer, Lieut.-Col. G. E., Deputy Commissioner. <i>Maulmain, B. Burmah.</i>
1867 Sept. 4.	N.S.	Fyfe, The Rev. W. C., M. A., Principal, Free Church College. <i>Europe.</i>



Date of Election.			
1880 April 7.	N.R.	Gajapati, Ananda Ram, Raja of Vizianagram.	<i>Vizianagram.</i>
1873 Dec. 3.	N.R.	Gamble, J. S., B. A., Asst. to Inspector General of Forests.	<i>Darjiling.</i>
1871 Aug. 2.	N.R.	Gangaprasad, Munshi, Depy. Collector.	<i>Mathura.</i>
1874 July 1.	N.S.	Gardner, David Mason, C. S., Offg. Magistrate and Collector.	<i>Europe.</i>
1879 Mar. 5.	R.	Garrett, A. W., M. A., Inspector of Schools, Presy. Circle.	<i>Calcutta.</i>
1859 Aug. 3.	L.M.	Gastrell, Major-General James Eardley (retired).	<i>7, Lansdowne Road, Wimbledon.</i>
1867 Dec. 4.	N.R.	Gay, E., M. A., C. S., Depy. Comptroller General.	<i>Bombay.</i>
1877 Aug 30.	R.	Ghosha, Jnanendra Chandra.	<i>Calcutta.</i>
1871 May 3.	R.	Ghosha, Káliprasanna.	<i>Calcutta.</i>
1877 Dec. 5.	N.R.	Ghosha, Dr. Krishna Dhana.	<i>Rangpur.</i>
1869 Feb. 3.	R.	Ghosha, Pratápachandra, B. A.	<i>Calcutta.</i>
1870 May 4.	R.	Ghoshál, Rájá Satyánand.	<i>Calcutta.</i>
1880 Aug. 4.	R.	Gibbs, The Hon. James, C. S. I., C. I. E., F. R. G. S., M. R. A. S., Member of the Governor General's Council.	<i>Calcutta.</i>
1875 July 7.	N.R.	Girdlestone, Charles Edward Ridgway, C. S., Resident.	<i>Katmandu, Nepal.</i>
1861 Feb. 5.	F.M.	Godwin-Austen, Lieut.-Colonel H. H., F. R. S., F. R. S., F. R. G. S.	<i>United Service Club, St. James', London.</i>
1862 July 2.	N.R.	Gordon, Robert, C. E., Executive Engineer, P. W. D.,	<i>Hezada, B. Burmah.</i>
1869 July 7.	N.R.	Gordon, James Davidson, C. S., C. S. I., Offg. Chief Commissioner.	<i>Mysore.</i>
1875 July 7.	N.S.	Gouldsbury, J. R. E.	<i>Europe.</i>
1863 Nov. 4.	F.M.	Gowan, Major-General J. Y.	<i>Woodlands, Wimbledon, London.</i>
1879 Jan. 8.	F.M.	Gowan, Capt. W. E., 21st Nat. Infy.	<i>Europe.</i>
1877 Nov. 7.	L.M.	Grant, Alexander, M. I. C. E., Director of State Railways.	<i>Europe.</i>
1876 Nov. 15.	N.R.	Grierson, George Abraham, C. S., Offg. Inspector of Schools, Behar Circle.	<i>Bankipur.</i>
1861 Sept. 4.	N.R.	Griffin, Lepel Henry, B. C. S., Depy. Commissioner and Offg. Secy. to the Govt. of the Punjab.	<i>Lahore.</i>
1878 May 2.	N.R.	Griffith, R.	<i>Allahabad.</i>
1861 Feb. 6.	N.R.	Growse, Frederick Salmon, M. A., C. S., C. I. E., Joint Magistrate.	<i>Bulandshahr, N. W. P.</i>
1880 Feb. 4.	R.	Gupta, Behárilál, C. S.	<i>Calcutta.</i>
1867 July 3.	N.R.	Hacket, Charles Augustus, Assistant, Geol. Survey of India.	
1879 Mar. 5.	R.	Harraden, S.	<i>Calcutta.</i>
1861 Feb. 2.	N.R.	Harrison, A. S., B. A., Principal, Muir Central College.	<i>Allahabad.</i>

Date of Election.		
1877 Sept. 27.	R.	Hart, J., Attorney at Law. <i>Calcutta.</i>
1880 Aug. 26.	N.R.	Hassan, Khalif Syad Mahomed, Khan Bahádur, Prime Minister. <i>Puttiala.</i>
1875 Mar. 3.	N.R.	Hendley, Dr. Thomas Holbein, Residency Surgeon, and Offg. Political Agent, Eastern Rajpootana States. <i>Jaipur, Rájputáná.</i>
1879 Mar. 5.	N.S.	Herschel, Major J., Survey of India. <i>Europe.</i>
1875 Aug. 4.	N.R.	Hewitt, James Francis Katherinus, c. s., Commissioner. <i>Ohota Nagpur.</i>
1872 Dec. 4.	R.	Hoernle, Rev. A. F. R., PH. D. <i>Calcutta.</i>
1878 Mar. 6.	N.R.	Hoey, W. <i>Lucknow, Oudh.</i>
1868 Nov. 4.	N.R.	Holroyd, Lieut.-Col. William Rice Morland, Director of Public Instruction. <i>Lahore, Punjab.</i>
1873 Jan. 8.	L.M.	Houstoun, G. L., F. G. S. <i>Johnstone Castle, Renfrewshire, Scotland.</i>
1863 Jan. 15.	N.R.	Howell, Mortimer Sloper, c. s., Judge. <i>Jaunpur.</i>
1867 Aug. 7.	N.R.	Hughes, T. H., A. B. S. M., F. G. S., Geol. Survey of India. <i>Kutni.</i>
1866 Jan. 17.	N.R.	Hughes, Captain W. G., M. S. C., Depy. Commissioner, Hill Tracts. <i>Arracan.</i>
1878 Sept. 25.	N.R.	Hughes, G., c. s., Assistant Commissioner. <i>Abbotabad, Hazara.</i>
1870 Jan. 5.	N.R.	Hume, Allan Octavian, C. B., C. S. <i>Allahabad.</i>
1872 Dec. 4.	N.R.	Ibbetson, Denzil Charles Jelf, c. s., Deputy Commissioner of the Punjab Census. <i>Simla.</i>
1866 Mar. 7.	N.R.	Irvine, William, c. s., Joint Magistrate. <i>Ghazipur.</i>
1871 Mar. 8.	N.S.	Isaac, T. S., C. E. <i>Europe.</i>
1853 Dec. 7.	N.R.	Isvariprasad Singh, Raja. <i>Benares.</i>
1874 Feb. 4.	R.	Jackson, Surgeon Major Charles Julian. <i>Calcutta.</i>
1878 May 2.	N.S.	Jackson, Sir L. S. <i>Europe.</i>
1880 Dec. 1.	N.R.	Jackson, William Grierson, B. C. S. <i>Mirzapur, N. W. P.</i>
1876 July 5.	F.M.	Jarrad, Lieut. F. W., B. N., F. E. A. S., Marine Survey Dept. <i>Hydrographic Office, Admiralty, London.</i>
1879 Mar. 5.	R.	Jarrett, Major H. S., B. S. C., Secy. to the Board of Examiners. <i>Calcutta.</i>
1879 Aug. 6.	F.M.	Joest, Herr W. <i>Cologne.</i>
1866 Feb. 7.	N.R.	Johnson, W. H., C. E. <i>Dera Ismail Khan.</i>
1862 Mar. 5.	N.R.	Johnstone, Lieut.-Colonel James William Hope, Commissioner. <i>Jallandhar.</i>
1867 Dec. 4.	N.R.	Johnstone, Lieut.-Col. James, Depy. Commissioner. <i>Assam.</i>
1878 Aug. 7.	N.R.	Johnstone, P. DeLacy, C. S. <i>Amritsar.</i>
1880 Jan. 7.	N.S.	Johnstone, Capt. W. H., B. E., A. I. C. E. <i>Europe.</i>
1873 Dec. 3.	N.R.	Johore, H. H., Maharaja of, K. C. S. I. <i>New Johore, Singapore.</i>
1873 April 2.	N.R.	Jones, Frederick, C. S., Magistrate and Collector. <i>Tipperah.</i>

Date of Election.		
1875 Nov. 3.	N.R.	Jones, Samuel Simpson, B. A., C. S., Asst. Commissioner. <i>Rajmahal.</i>
1869 April 7.	R.	Kabiruddin Ahmad, Maulawi. <i>Calcutta.</i>
1876 April 5.	R.	Kantichandra Singh, Kumara. <i>Calcutta.</i>
1878 Mar. 6.	N.R.	Keene, H. G., C. S. <i>Agra.</i>
1874 Dec. 2.	N.R.	Khudabakhsh Khan, Maulawi. <i>Patna.</i>
1867 Dec. 4.	R.	King, G., M. B., F. L. S., Supdt., Royal Botanical Gardens. <i>Sibpur, Calcutta.</i>
1862 Jan. 15.	N.R.	King, W., Jr., B. A., F. G. S., Depy. Supdt. for Madras, Geol. Survey of India. <i>Yercaud, Shevaroy Hills, Madras.</i>
1880 Dec. 1.	R.	Kirton, Surgeon-Major William Henry, F. L. S. <i>Calcutta.</i>
1880 Jan. 7.	R.	Kisch, H. M., M. A., C. S. <i>Calcutta.</i>
1877 Jan. 17.	N.R.	Kishor, Kumara Radha Deb, Juvraj of Hill Tipperah. <i>Tipperah.</i>
1875 Dec. 1.	R.	Knight, Hon'ble J. B., C. I. E. <i>Calcutta.</i>
1878 Oct. 4.	N.R.	Lachman Singh, Raja. <i>Bulandshahr.</i>
1880 Aug. 4.	N.R.	Lambe, W., C. S. <i>Jamnpur, N. W. P.</i>
1877 Sept. 27.	N.R.	La Touche, James John Digges, B. A., C. S., Offg. Joint Magistrate. <i>Moradabad.</i>
1878 Aug. 7.	N.R.	Lawrie, Dr. E. <i>Lahore.</i>
1880 Sept. 30.	R.	Lees, R. O. <i>Calcutta.</i>
1879 Dec. 3.	N.R.	Leonard, G. S., Offg. Traffic Supdt., N. B. State Ry. <i>Saidpur.</i>
1870 July 6.	R.	Lethbridge, E. Roper, M. A., C. I. E. <i>Calcutta.</i>
1879 Mar. 5.	R.	Levinge, H. C., C. E., Joint Secy. to the Govt. of Bengal, D. P. W. <i>Calcutta.</i>
1880 July 7.	N.R.	Lewis, Rev. Arthur, B. A. <i>Dera Ghazi Khan.</i>
1873 Feb. 5.	R.	Lewis, Timothy Richards, M. B., Special Asst. to the Sanitary Commissioner with the Government of India. <i>Calcutta.</i>
1864 Nov. 2.	R.	Locke, H. H., Principal, School of Art. <i>Calcutta.</i>
1866 Jan. 17.	N.R.	Low, James, Surveyor, G. T. Survey. <i>B. Burmah.</i>
1869 July 7.	N.R.	Lyall, Charles James, B. A., C. S., Offg. Secy. to the Chief Commissioner of Assam. <i>Shillong.</i>
1875 Jan. 6.	R.	Lydekker, Richard, Asst., Geol. Survey of India. <i>Geological Survey Office, Calcutta.</i>
1870 April 6.	L.M.	Lyman, B. Smith. <i>Japan.</i>
1880 Dec. 1.	R.	McCann, H. W., M. A., D. Sc., Prof., Presidency College. <i>Calcutta.</i>
1868 Dec. 2.	N.R.	Macauliffe, Michael, B. A., C. S., Depy. Commissioner. <i>Hissar, Punjab.</i>
1866 June 6.	N.S.	Macdonald, Lieut.-Col. J., B. S. C., Depy. Superintendent of Surveys. <i>Europe.</i>
1880 June 2.	N.R.	Macdonald, James, C. E. <i>Aligarh.</i>

Date of Election.		
1879 Feb. 5.	N.R.	Macgregor, Capt. C. R., 44th N. I., Transport Officer. <i>Kabul.</i>
1876 Jan. 5.	N.R.	Macgregor, W., Supdt., Telegraphs. <i>Dhubri, Assam.</i>
1843 April 5.	L.M.	MacLagan, Major-General Robert, R. E., F. R. S. E., F. R. G. S. <i>Europe.</i>
1873 Dec. 3.	R.	MacLeod, Surgeon-Major Kenneth, M. D. <i>Calcutta.</i>
1880 May 5.	N.R.	MacLeod, Roderick Henry, B. C. S. <i>Benares.</i>
1879 Aug. 28.	N.R.	Maconachie, R., C. S., Settlement Secy. to the Financial Commissioner. <i>Lahore.</i>
1874 Jan. 7.	N.R.	Magrath, Charles Frederick, B. A., C. S., Offg. Magistrate and Collector. <i>Rangpur.</i>
1867 April 3.	R.	Mainwaring, Lieut.-Col. George Byres, S. C. <i>Seram-pur.</i>
1880 Mar. 3.	R.	Maliáh, Ramesvar. <i>Howrah.</i>
1876 Dec. 6.	N.S.	Malleson, Col. G. B., C. S. I. <i>Europe.</i>
1878 April 3.	R.	Mallet, F. R., Geological Survey of India. <i>Calcutta.</i>
1864 July 6.	R.	Mallik, Coomar Devendra. <i>Calcutta.</i>
1869 Sept. 1.	R.	Mallik, Yadulál. <i>Calcutta.</i>
1872 Nov. 6.	N.R.	Man, E. H., Asst. Supdt. <i>Port Blair, Andamans.</i>
1880 May 5.	N.R.	Mandalik, The Hon. Rao Sahib Visvanath Narayana, C. S. I. <i>Bombay.</i>
1877 Dec. 5.	N.R.	Mandelli, L. <i>Darjiling.</i>
1869 July 7.	N.R.	Markham, Alexander Macaulay, C. S., Offg. Magistrate and Collector. <i>Allahabad.</i>
1873 July 2.	N.R.	Marshall, C. W. <i>Gonatra, Synthea.</i>
1873 Aug. 6.	N.R.	Marshall, Lieut.-Col. William Elliot.
1877 Feb. 7.	R.	Marshall, Capt. Geo. Fred. Leycester, R. E., Asst. Secy., Govt. of India, P. W. D. <i>Calcutta.</i>
1860 Mar. 7.	R.	Medlicott, H. B., M. A., F. R. S., F. G. S., Supdt., Geological Survey of India. <i>Calcutta.</i>
1877 Mar. 7.	R.	Medlycott, The Rev. Adolphus Edwin, P. H. D., 3, <i>Cullen Place, Howrah.</i>
1871 Sept. 6.	N.R.	Miles, Lieut.-Colonel S. B., S. C., Political Agent. <i>Muscat.</i>
1870 July 6.	R.	Miller, A. B., B. A., Barrister at Law, Official Assignee. <i>Calcutta.</i>
1874 May 6.	N.R.	Minchin, F. J. V. <i>Aska, Ganjam.</i>
1875 Aug. 4.	N.R.	Minchin, Lieut.-Col. C. C. <i>Hissar, Panjab.</i>
1856 Mar. 5.	R.	Mitra, Rájendralála, Rái Bahádur, LL. D., C. I. E. <i>Calcutta.</i>
1876 Dec. 6.	N.S.	Mockler, Major E., Political Agent. <i>Europe.</i>
1874 July 1.	R.	Molesworth, G. L., C. E., Consulting Engineer to Govt. of India for State Railways. <i>Calcutta.</i>
1878 May 2.	R.	Moyle, J. C., Barrister at Law, High Court. <i>Calcutta.</i>
1864 Nov. 2.	N.R.	Mukerjea, Bhudeva, Inspector of Schools. <i>Chinsurah.</i>
1879 May 7.	N.R.	Muir, J. W., M. A., C. S., Barrister at Law. <i>Main-puri, N. W. P.</i>
1867 Mar. 6.	R.	Mukerjea, The Hon. Pearimohan, M. A. <i>Uttarpara.</i>
1880 Aug. 26.	R.	Mullick, Benod Behari. <i>Calcutta.</i>

Date of Election.		
1880 Aug. 26.	N.R.	Nag, Sib Chunder. <i>Chittagong.</i>
1880 Dec. 1.	R.	Napier, J. R. <i>Calcutta.</i>
1876 May 4.	R.	Nash, A. M., M. A., Professor, Presidency College. <i>Calcutta.</i>
1865 Feb. 1.	R.	Nevill, G., C. M. Z. S., Indian Museum. <i>Calcutta.</i>
1880 Aug. 26.	N.R.	Nicholson, Richardson Walter, Sub-Deputy Opium Agent. <i>Sultanpur, Oudh.</i>
1869 July 7.	N.R.	Nursing Rao, A. V. <i>Vizagapatam.</i>
1871 July 5.	N.R.	Oates, E. W., C. E., Engineer, P. W. D., Garrison Div., Sittang Canal. <i>Rangoon, Pegu.</i>
1874 Oct. 4.	N.S.	O'Kinealy, The Hon'ble James, C. S., District and Sessions Judge, 24. Pergannahs. <i>Europe.</i>
1879 Aug. 28.	N.R.	Oldham, Surgeon-Major C. F., F. R. G. S. <i>Dhurnsala, Panjab.</i>
1880 Dec. 1.	N.R.	Oldham, R. D., A. B. S. M., Asst., Geological Survey of India.
1873 Aug. 6.	N.R.	Olpherts, W. J., C. E., Manager, Kaharbari Collieries. <i>Giridhi, E. I. B.</i>
1880 Aug. 4.	L.M.	Pandia, Pandit Mohanlall Vishnulall, F. T. S., Member and Secy., Royal Council of Meywar. <i>Oodeypur.</i>
1880 Jan. 7.	R.	Pargiter, Frederick E., B. A., C. S., Officiating Commissioner of the Sunderbunds. <i>Calcutta.</i>
1873 Aug. 6.	R.	Parker, J. C. <i>Calcutta.</i>
1880 Jan. 7.	N.R.	Parry, J. W., C. E., Assoc. M. I. C. E., Asst. Engineer. <i>Gwalior.</i>
1862 May 7.	L.M.	Partridge, Surgeon-Major Samuel Bowen, M. D. <i>Europe.</i>
1879 Mar. 5.	N.R.	Pawsey, R., C. S., Collector. <i>Cuttack.</i>
1871 Dec. 6.	N.R.	Peal, S. E., Manager, Sapakati Tea Estate. <i>Sibsagar, Assam.</i>
1860 Feb. 1.	N.R.	Pearse, Major-General G. G., R. H. A. <i>Bangalore.</i>
1873 Aug. 6.	R.	Pedler, Alexander, F. C. S., Professor of Chemistry, Presidency College. <i>Calcutta.</i>
1864 Mar. 2.	N.R.	Pellew, Fleetwood Hugo, C. S., Offg. Commissioner. <i>Dacca.</i>
1865 Sept. 6.	N.R.	Peppe, T. E. <i>Ranchi.</i>
1877 Aug. 1.	F.M.	Peters, C. T., M. B., Offg. Agency Surgeon. <i>Zanzibar.</i>
1868 May 6.	N.R.	Peterson, F. W., Bombay Mint. <i>Bombay.</i>
1835 July 1.	F.M.	Phayre, Sir Arthur Purves, K. C. S. I., C. B., c/o H. S. King and Co. <i>London.</i>
1872 Dec. 4.	R.	Pránnáth Sarasvati, Pandit, M. A., B. L. <i>Bhowanipur.</i>
1880 June 2.	N.R.	Prasad Sinh, Thakur Garuradhawaya, Raja of Beswan. <i>Beswan Fort, Aligarh.</i>
1877 Aug. 30.	N.R.	Pratapnarayan Singha, Depy. Magistrate. <i>Bankoora.</i>
1878 Feb. 6.	R.	Prinsep, the Hon'ble H. T., Judge of the High Court. <i>Calcutta.</i>
1874 Dec. 2.	N.R.	Protheroe, Major M., Depy. Supdt. of Port Blair and the Nicobars.

Date of Election.		
1871 June 7.	R.	Ramkrishna. <i>Calcutta.</i>
1878 Aug. 29.	N.R.	Rangoon, Right Rev., Bishop of. <i>Rangoon.</i>
1877 May 2.	N.R.	Ravenshaw, Thomas Edw., c. s., Commissioner of Burdwan Division. <i>Chinsurah.</i>
1880 April 7.	N.R.	Kai, Bipina Chandra, B. L., Munsiff. <i>Netrokona, Maimansingh.</i>
1868 April 1.	N.R.	Rái, Rájá Pramathanath. <i>Digapati.</i>
1877 Aug. 1.	N.R.	Rees, J. C., Asst. Engr., P. W. D. <i>Thonzai, British Burmah.</i>
1871 July 5.	N.S.	Reid, James Robert, c. s. <i>Europe.</i>
1880 Aug. 4.	N.R.	Reynolds, Herbert William Ward, c. s. <i>Jaunpur.</i>
1860 Jan. 3.	N.R.	Rivett-Carnac, John Henry, c. s., C. I. E., F. S. A., Opium Agent. <i>Ghazipur.</i>
1863 April 1.	N.R.	Robertson, Charles, c. s., Secretary to the Govt., N. W. P. and Oudh. <i>Allahabad.</i>
1878 Sept. 25.	R.	Robertson, Rev. J. <i>Calcutta.</i>
1865 Feb. 1.	R.	Robinson, S. H. <i>Calcutta.</i>
1876 Dec. 6.	N.S.	Rodon, Lieut. G. S., Royal Scots. <i>Europe.</i>
1870 Jan. 5.	N.R.	Ross, Major Alexander George, Staff Corps, 2nd in Comd., 1st Sikh Infy. <i>Dera Ghazi Khan, Panjab.</i>
1880 Sept. 30.	N.R.	Sage, E. M. <i>Rangoon.</i>
1877 May 2.	N.R.	Sandford, W., Assistant Traffic Manager, Nizam's State Railway. <i>Secunderabad, Deccan.</i>
1878 Jan. 2.	R.	Sawyer, Capt. H. A., Military Department. <i>Calcutta.</i>
1870 May 4.	N.R.	Schlich, Dr. W. <i>Lahore.</i>
1879 May 7.	N.S.	Schroder, J. <i>Europe.</i>
1869 Feb. 3.	R.	Schwendler, L., Telegraph Store Department. <i>Calcutta.</i>
1879 Feb. 5.	R.	Sconce, Lt.-Col. J., B. s. c. <i>Calcutta.</i>
1876 July 5.	N.R.	Scott, Ross, c. s., Assistant Magistrate and Collector. <i>Furrakhabad.</i>
1874 July 1.	F.M.	Scully, Dr. John, c/o H. S. King and Co. <i>London.</i>
1878 Mar. 6.	N.R.	Sen, Adharlal, B. A., Offg. Depy. Magistrate and Collector. <i>Jessore.</i>
1874 Dec. 2.	N.R.	Sen, Dr. Rám Dás. <i>Berhampur.</i>
1879 Jan. 8.	N.R.	Sewell, R., M. s. c., c/o Messrs. Arbuthnot and Co. <i>Madras.</i>
1878 May 2.	R.	Sharpe, C. J. <i>Calcutta.</i>
1879 May 7.	N.R.	Sheridan, C. J., c. E. <i>Lucknow.</i>
1878 April 3.	R.	Simson, A. <i>Calcutta.</i>
1867 April 3.	R.	Sirkár, Dr. Mahendralála. <i>Calcutta.</i>
1872 Aug. 7.	N.R.	Skrefsrud, Rev. L. O., India Home Mission to the Santhals. <i>Dúmka, Santhal Purgunnahs.</i>
1864 Sept. 7.	N.S.	Sladen, Col. E. B., M. s. c., Commissioner, Arracan Division. <i>Europe.</i>
1865 July 5.	R.	Smith, David Boyes, M. D. <i>Calcutta.</i>
1874 June 3.	N.R.	Smith, Vincent Arthur, c. s., Asst. Settlement Officer. <i>Bareilly, N. W. P.</i>

## Date of Election

1879 Mar. 5.	N.S.	Someren, Capt. G. J. van	<i>Europe.</i>
1875 Mar. 6.	R.	Souttar, W. M., Chairman of the Corporation.	<i>Calcutta.</i>
1877 April 4.	N.R.	Spens, The Rev. A. N. W., Chaplain.	<i>Sialkot.</i>
1872 July 3.	N.R.	Stephen, Carr, B. L., Judl. Asst. Commr.	<i>Ludiansh.</i>
1879 Oct. 2.	R.	Sterndale, R. A., F. R. S., Asst. Comr. of Currency.	<i>Calcutta.</i>
1875 July 7.	R.	Stewart, M. G.	<i>Calcutta.</i>
1876 Aug. 2.	N.R.	St. John, Lieut.-Col. Oliver Beauchamp, R. E., C. S. I., Political Officer.	<i>Kandahar.</i>
1861 Sept. 4.	R.	Stokes, The Hon'ble Whitley, C. S. I., C. I. E.	<i>Calcutta.</i>
1869 Feb. 3.	N.S.	Strachey, Sir J., K.C.S.I., C. I. E.	<i>Europe.</i>
1859 Mar. 2.	N.R.	Stubbs, Lieut.-Col. Francis William, Royal Artillery.	
1880 Nov. 3.	N.R.	Sturt, Lieut. Robert Ramsay Napier, B. S. C., Panjab Frontier Force.	<i>Edwardsabad, Panjab.</i>
1864 Aug. 11.	R.	Swinhoe, W., Attorney-at-Law.	<i>Calcutta.</i>
1880 Nov. 3.	N.R.	Swynnerton, Rev. Charles.	<i>Naukhera.</i>
1880 June 2.	N.R.	Sykes, John Gastrell, LL. B., Barrister-at-Law and Advocate, High Court, N. W. P.	<i>Allahabad.</i>
1871 Mar. 1.	R.	Tagore, Dvijendranath.	<i>Calcutta.</i>
1871 Jan. 4.	R.	Tagore, Gunendranath.	<i>Calcutta.</i>
1868 June 3.	R.	Tagore, The Hon'ble Maharaja Jotendra Mohun, C. S. I.	<i>Calcutta.</i>
1865 Sept. 6.	R.	Tawn-y, C. H., M. A., Principal, Presidency College.	<i>Calcutta.</i>
1874 Mar. 4.	R.	Taylor, Commander A. D., late Indian Navy.	<i>Calcutta.</i>
1860 May 2.	N.S.	Temple, Sir R., Bart., K. C. S. I., C. I. E., B. C. S.	<i>Europe.</i>
1878 June 5.	N.R.	Temple, Lieut. R. C., s. c., Cantonment Magte.	<i>Ferozepore, Panjab.</i>
1876 Feb. 2.	R.	Tennant, Col. James Francis, R. E., F. R. S., C. I. E.	<i>Mint Master. Calcutta.</i>
1875 June 2.	N.R.	Thibaut, Dr. G., Prof. Sanskrit College.	<i>Benares.</i>
1869 Oct. 6.	N.R.	Thomson, A., The College,	<i>Agra.</i>
1875 Nov. 3.	N.R.	Thomson, Robert George, c. s., Asst. Commr.	<i>Jhelum, Panjab.</i>
1847 June 2.	L.M.	Thuillier, Major-Genl. Sir Henry Edward Landor, B. A., C. S. I., F. R. S.	<i>Care of Messrs. Grindlay and Co., 55, Parliament St., London.</i>
1865 July 5.	N.R.	Tolbort, Thos. Wm. Hooper, c. s., Offg. Deputy Commissioner.	<i>Gujranwala.</i>
1871 April 5.	F.M.	Trefftz, Oscar.	<i>Care of Messrs. E. D. Keilhorn and Co., 16, St. Mary Axe, London.</i>
1861 June 5.	L.M.	Tremlett, James Dyer, M. A., c. s.	<i>Addl. Commissioner. Jalandhar, Panjab.</i>
1872 July 3.	N.R.	Trevor, Lieut.-Col. William Spottiswoode, R. E., Chief Engineer and Secy. to Chief Commissioner.	<i>Rangoon.</i>

Date of Election.		
1880 Mar. 3.	N.R.	Tufnell, Lieut. R. H. C., 30th M. N. I. 7, <i>High Road, Nungambanahun, Madras.</i>
1873 April 6.	R.	Turnbull, Robert, Secretary to the Corporation. <i>Calcutta.</i>
1863 May 6.	N.R.	Tyler, J. W., M. D., F. R. C. S., Supdt., Central Prison. <i>Agra.</i>
1869 Aug. 4.	R.	Wáhid Ali, Prince Jahán Qadr Muhammad, Bahádur. <i>Gurden Reach.</i>
1865 Nov. 1.	R.	Waldie, David, F. C. S. <i>Calcutta.</i>
1861 May 1.	R.	Walker, Major-Genl. James T., R. E., C. B., F. R. S., Surveyor General of India. <i>Calcutta.</i>
1875 April 7.	N.S.	Wall, Dr. Alfred John. <i>Europe.</i>
1863 Oct. 7.	R.	Waller, Walter Kerr, M. B. <i>Calcutta.</i>
1865 May 3.	F.M.	Waterhouse, Major James, B. S. C., Dy. Supdt., Survey of India. <i>Europe.</i>
1874 July 1.	N.S.	Watt, Dr. George, Professor. <i>Europe.</i>
1876 Dec. 6.	R.	Webb, W. T., M. A., Professor, Presidency College. <i>Calcutta.</i>
1879 Mar. 5.	N.R.	Weekes, A., C. S., Collector. <i>Furidpur.</i>
1869 Sept. 1.	R.	Westland, James, C. S., Offg. Comptroller General. <i>Calcutta.</i>
1867 Feb. 6.	N.R.	Westmacott, Edward Vesey, B. A., C. S., Offg. Magte. and Collr. <i>Noakholly.</i>
1862 Oct. 8.	N.S.	Wheeler, James Talboys. <i>Europe.</i>
1878 Aug. 29.	N.R.	Wheeler, P. C., C. S., Asst. Magistrate. <i>Ghazipur.</i>
1875 Feb. 3.	N.R.	Whiteway, Richard Stephen, C. S., Asst. Settlement Officer. <i>Muttra.</i>
1878 Aug. 29.	N.R.	Whittall, R., Forest Dept. <i>Hoshangabad, Central Provinces.</i>
1873 May 7.	N.R.	Williams, George Robert Carlisle, B. A., C. S., Magte. and Collr. <i>Farakhabad.</i>
1867 Jan. 16.	N.R.	Williamson, Capt. William John, C. I. E., Insp.-Genl. of Police. <i>Shillong, Khasi Hills.</i>
1880 Feb. 4.	R.	Wilson, The Hon. Arthur. <i>Calcutta.</i>
1870 Aug. 3.	N.S.	Wilson, Robert Henry, B. A., C. S., Offg. Secy. to Board of Revenue. <i>Europe.</i>
1878 Mar. 6.	N.R.	Wilson, J. <i>Sirsa, Punjab.</i>
1866 Mar. 7.	L.M.	Wise, Dr. J. F. N. <i>Rostellan, County Cork. Ireland.</i>
1867 July 3.	N.R.	Wood, Dr. Julius John, Supdt. of Vaccination. <i>Darjiling Circle.</i>
1870 Jan. 5.	R.	Wood-Mason, James, Depy. Supdt., Indian Museum. <i>Calcutta.</i>
1873 Aug. 6.	N. R.	Woodthorpe, Capt. Robert Gossett, R. E., Asst. Supdt., Survey of India. <i>Frontier Expeditionary Force. Kabul.</i>



## HONORARY MEMBERS.

1821 Mar.	6.	Sir John Phillippart.	<i>London.</i>
1826 July	1.	Count de Noe.	<i>Paris.</i>
1834 May	6.	Professor Isaac Lea.	<i>Philadelphia.</i>
1847 Sept.	1.	Col. W. Munro.	<i>London.</i>
1847 Nov.	3.	His Highness the Nawáb Nazim of Bengal.	<i>Europe.</i>
1848 Feb.	2.	Dr. J. D. Hooker, B. N., F. R. S.	<i>Kew.</i>
1853 April	6.	Major-Gen. Sir H. C. Rawlinson, K. C. B.	<i>London.</i>
1858 July	6.	B. H. Hodgson.	<i>Europe.</i>
1860 Mar.	7.	Professor Max Müller.	<i>Oxford.</i>
1860 Nov.	7.	Edward Thomas.	<i>London.</i>
1860 "	7.	Dr. Aloys Sprenger.	<i>Bern.</i>
1860 "	7.	Dr. Albrecht Weber.	<i>Berlin.</i>
1868 Feb.	5.	General A. Cunningham, C. S. I.	<i>India.</i>
1868 "	5.	Professor Bápu Déva Sástri.	<i>Benares.</i>
1868 "	2.	A. Grote.	<i>London.</i>
1871 "	7.	Charles Darwin.	<i>London.</i>
1872 "	1.	Sir G. B. Airy.	<i>London.</i>
1872 June	5.	Professor T. H. Huxley.	<i>London.</i>
1875 Nov.	3.	Dr. O. Böhtlingk.	<i>Jena.</i>
1875 "	3.	Professor J. O. Westwood.	<i>Oxford.</i>
1876 April	5.	Col H. Yule, R. E., C. B.	<i>London.</i>
1876 "	5.	Dr. Werner Siemens.	<i>Berlin.</i>
1877 Jan.	17.	Dr. John Muir.	<i>Edinburgh.</i>
1879 June	4.	Prof. E. B. Cowell, D. C. L.	<i>Cambridge.</i>
1879 "	4.	Dr. A. Günther, V. P. R. S.	<i>London.</i>
1879 "	4.	Dr. J. Janssen.	<i>Paris.</i>
1879 "	4.	Prof. H. Milne-Edwards.	<i>Paris.</i>
1879 "	4.	Prof. P. Regnaud.	<i>Lyons.</i>
1879 "	4.	M. E. Renan.	<i>Paris.</i>

## CORRESPONDING MEMBERS.

1844 Oct.	2.	Macgowan, Dr. J.	<i>Europe.</i>
1856 June	4.	Krämer, Herr A. von.	<i>Alexandria.</i>
1856 "	3.	Porter, Rev. J.	<i>Damascus.</i>
1856 "	4.	Schlagintweit, Herr H. von.	<i>Berlin.</i>
1856 "	4.	Smith, Dr. E.	<i>Beyrout.</i>
1859 "	4.	Tailor, J., Esq.	<i>Bussorah.</i>
1857 Mar.	4.	Nietner, J., Esq.	<i>Ceylon.</i>
1858 "	3.	Schlagintweit, Herr R. von.	<i>Berlin.</i>
1859 Nov.	2.	Frederick, Dr. H.	<i>Batavia.</i>
1860 Feb.	1.	Baker, The Rev. H.	<i>E. Malabar.</i>
1861 July	3.	Gösche, Dr. R.	
1862 Mar.	3.	Murray, A., Esq.	<i>London.</i>
1863 July	4.	Barnes, R. H., Esq.	<i>Ceylon.</i>
1866 May	7.	Schlagintweit, Prof. E. von.	<i>Berlin.</i>
1868 "	5.	Holmböe, Prof.	<i>Christiania.</i>

# ASSOCIATE MEMBERS.

1865 May 3.	Dall, Rev. C. H. <i>Calcutta.</i>
1874 Feb. 4.	Schaumburgh, J., Esq. <i>Calcutta.</i>
1874 April 1.	Lafont, Rev. Fr. E., s. J., c. i. e. <i>Calcutta.</i>
1875 Dec. 1.	Bate, Rev. J. D. <i>Allahabad.</i>
1875 „ 1.	Maulawí Abdul Hai, Madrasah. <i>Calcutta.</i>

## LIST OF MEMBERS WHO HAVE BEEN ABSENT FROM INDIA THREE YEARS AND UPWARDS.\*

\* *Rule 40.*—After the lapse of 3 years from the date of a Member leaving India, if no intimation of his wishes shall in the interval have been received by the Society, his name shall be removed from the list of Members.

The following Members will be removed from the next Member List of the Society under the operation of the above Rule.

Major-Gen. C. H. Dickens, B. A., C. S. I., ...	1877.
J. R. E. Gouldsbury, Esq., .....	1877.
Lieut.-Col. J. Macdonald, .....	1877.
Col. G. B. Malleson, C. S. I., .....	1877.
Lieut. G. S. Rodon, .....	1877.

## LOSS OF MEMBERS DURING 1880.

### BY RETIREMENT.

W. E. Brooks, Esq. <i>Muddapur.</i>
H. Buckle, Esq. <i>Toung-hoo.</i>
Col. H. A. Browne. <i>Rangoon.</i>
C. D. Field, Esq. <i>Burdwan.</i>
J. C. Macdonald, Esq. <i>Naini Tal.</i>
Hon. G. G. Morris. <i>Calcutta.</i>
E. O'Brien, Esq. <i>Muzaffargarh.</i>
Dr. D. O'C. Raye. <i>Calcutta.</i>
Dr. V. Richards. <i>Goalundo.</i>
Hon. J. Sewell White. <i>Calcutta.</i>

### BY DEATH.

#### *Ordinary Members.*

H. L. Dennys. <i>Damoh, C. P.</i>
Thakur Giriprasad Singh. <i>Aligarh.</i>

*Honorary Members.*

Hon. Sir J. W. Colvile, Kt. *Europe.*

*Corresponding Member.*

Rev. M. A. Sherring, M. A. *Benares.*

BY REMOVAL.

*Under Rule 40.*

J. Smidt. *Europe.*

R. Taylor, C. S. *Europe.*

*Under Rule 38.*

J. F. Baness, Esq. *Calcutta.*

P. Dejoux, Esq. *Calcutta.*

J. S. Gunn, Esq., M. B. *Sandáwar.*

W. Porter, Esq. *Akyab.*

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[APPENDIX.]

ABSTRACT STATEMENT  
OF  
RECEIPTS AND DISBURSEMENTS  
OF THE  
ASIATIC SOCIETY OF BENGAL  
FOR  
THE YEAR 1880.

# STATEMENT, *Asiatic Society of*

Dr.

To ESTABLISHMENT.				
Salaries, ...	...	...	Rs. 4,421 15 1	
Commission, ...	...	...	... 269 15 2	
Pensions, ...	...	...	... 102 0 0	
				<hr/>
				4,793 14 3
				<hr/>
CONTINGENCIES.				
Stationery, ...	...	...	... 304 11 9	
Lighting, ...	...	...	... 86 8 0	
Building, ...	...	...	... 343 4 0	
Taxes, ...	...	...	... 780 0 0	
Postage, ...	...	...	... 496 5 9	
Freight, ...	...	...	... 36 0 0	
Meetings, ...	...	...	... 96 12 0	
Miscellaneous, ...	...	...	... 409 12 1	
				<hr/>
				2,553 5 7
				<hr/>
LIBRARY AND COLLECTIONS.				
Books, ...	...	...	... 1,695 1 6	
Local Periodicals, ...	...	...	... 66 12 0	
Book-cases, ...	...	...	... 1,036 0 0	
Binding, ...	...	...	... 629 14 0	
Coins, ...	...	...	... 138 9 1	
				<hr/>
				3,466 4 7
				<hr/>
PUBLICATIONS.				
Printing, ...	...	...	... 3,849 8 0	
Plates, ...	...	...	... 2,465 12 3	
				<hr/>
				6,315 4 3
				<hr/>
To PERSONAL ACCOUNT (Writes off and Miscellaneous),...				954 6 5
Total Expenditure,				<hr/>
				18,083 3 1
To Balance, ...	...	...	...	<hr/>
				1,44,416 14 11
				<hr/>
Total, Rs.				1,62,500 2 0
				<hr/>

No. 1.  
*Bengal.*

Cr.

By Balance from last Report, ... .. Rs. 1,43,434 0 11

By CASH RECEIPTS.

Publications sold for Cash,	...	...	223	1	6
Interest on investments, ...	...	...	6,179	0	0
Coins, ...	...	...	1	15	6
Contingencies, ...	...	...	4	1	6
Furniture (sale of old show cases),	...	...	23	4	6
			<u>6,431</u>	<u>7</u>	<u>0</u>

By PERSONAL ACCOUNT.

Admission Fees, ...	...	...	1,168	0	0
Subscriptions, ...	...	...	7,695	0	0
Sales on credit, ...	...	...	1,570	14	0
Miscellaneous (chiefly old outstandings and 'omissions brought to credit), ...	...	...	2,200	12	1
			<u>12,634</u>	<u>10</u>	<u>1</u>

Total Income, ————— 19,066 1 1

Total, Rs. ... 1,62,500 2 0

JOHN C. DOUGLAS,  
*Hony. Treasurer, Asiatic Society.*

J. WESTLAND, }  
J. SCONCE, } *Auditors.*

# STATEMENT

## *Oriental Publication Fund in Account*

Dr.

To CASH EXPENDITURE.				
Printing charges,	...	...	Rs. 5,230	2 3
Plates,	...	...	...	84 0 0
Editing charges,	...	...	...	973 8 0
Salaries,	...	...	...	866 3 2
Advertising,	...	...	...	120 0 0
Freight,	...	...	...	16 2 6
Contingencies,	...	...	...	94 12 0
Postage,	...	...	...	38 8 3
Commissions on collecting bills,	...	...	...	1 8 3
				7,424 12 5
To PERSONAL ACCOUNT (Writes off and Miscellaneous),	...	...	138	7 0
Total Expenditure,				7,563 3
To Balance,	...	...	...	... 10,540 9
				Total, Rs. 18,103 13

No. 2.

*with the Asiatic Society of Bengal.***Cr.**

By Balance from last Report, ...	...	...	Rs. 5,004 13 10
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**By CASH RECEIPTS.**

Government allowance, ...	...	...	9,000 0 0
Publications sold, ...	...	...	2,105 2 0
Advances recovered, ...	...	...	103 11 9

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11,208 13 9
**By PERSONAL ACCOUNT.**

Sales on credit, ...	...	...	1,758 1 9
Miscellaneous, ...	...	...	132 0 0

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1,890 1 9

Total Income, ————— 13,098 15 6

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Total, Rs. 18,103 13 4

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JOHN C. DOUGLAS,  
*Hon'y. Treasurer, Asiatic Society.*

J. WESTLAND, }  
J. SCONCE, } *Auditors.*



## STATEMENT

### *Sanskrit Manuscripts Fund in Account*

Dr.

TO CASH EXPENDITURE.			
Salaries, ...	...	Rs. 1,383	2 0
Travelling expenses, ...	...	291	6 0
Printing, ...	...	489	4 0
Plates, ...	...	116	14 0
MSS. purchased, ...	...	1,103	7 0
Stationery, ...	...	19	12 0
Postage, ...	...	0	13 6
Copying, ...	...	10	2 0
Contingencies, ...	...	26	7 0
Total Expenditure,		3,441	3 0
To Balance, ...	...	2,131	14 0
Total, Rs.		5,573	1 0

No. 3.

*with the Asiatic Society of Bengal.***Cr.**

By Balance from last Report, ...	...	...	Rs. 2,339 14 8
<b>By CASH RECEIPTS.</b>			
Government allowance, ...	...	... 3,200 0 0	
Balance of petty cash recovered, ...	...	... 1 1 0	
Publications sold for cash, ...	...	... 8 2 0	
		<hr/>	
		3,209 3 0	
<b>By PERSONAL ACCOUNT.</b>			
Publications sold on credit, ...	...	... 24 0 0	
		<hr/>	
		Total Income,	3,233 3 0
			<hr/>
		Total, Rs.	5,573 1 8
			<hr/>

JOHN C. DOUGLAS,

*Hony. Treasurer, Asiatic Society.*

J. WESTLAND, }  
 J. SCONCE, } *Auditors.*

# STATEMENT

## *Personal*

### Dr.

To Balance from last Report, .. .. .	4,612	3	4
To CASH EXPENDITURE.			
Advances for purchase of Sanskrit MSS., postage of books			
to Members, &c., .. .. .	1,339	8	4
To Asiatic Society, .. .. .	12,634	10	1
To Oriental Publication Fund, .. .. .	1,890	1	8
To Sanskrit Manuscripts Preservation Fund, .. .. .	24	0	0

Total, .. 20,500 7 7

No. 4.  
*Account.*

Cr.

By Cash Receipts, .. ..	12,427	4	3
By Asiatic Society, .. ..	954	6	5
By Oriental Publication Fund, .. ..	138	7	0

By Balances.	Due to the Society.			Due by the Society.			
Old claims,.. ..	1,146	14	..	..	..	..	
Members, .. ..	4,514	8	1	186	12	11	
Subscriptions to Publications, .. ..	1,293	13	2	2,235	12	6	
Employees, .. ..	471	4	..	..	..	..	
Agents, .. ..	1,930	2	7	..	..	..	
Miscellaneous, .. ..	278	12	..	232	6	6	
	9,635	5	10	2,654	15	11	6,980 5 11
							<hr/>
Total, ..							20,500 7 7
							<hr/>

JOHN C. DOUGLAS,

*Hon. Treasurer, Asiatic Society.*

J. WESTLAND, }  
J. SCONCE, } *Auditors..*

## STATEMENT, *Invest*

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Dr.			
	Nominal.		Actual.
To Balance, .. ..	.. 1,48,300 0 0		1,47,618 0 0
	Total, .. 1,48,300 0 0		1,47,618 0 0

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## STATEMENT, *Trust*

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Dr.			
Remitted for Blochmann Memorial, ..	.. ..		1,268 4 6
To Balance (being servants' pension fund only), ..	.. ..		1,007 11 4
	Total, ..		2,275 15 10

---

## STATEMENT, *Cash.*

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Dr.			
To Balance from last Report, ..	.. ..		10,974 9 11
RECEIPTS.			
To Personal account, ..	.. ..		12,427 4 3
To Asiatic Society, ..	.. ..		6,431 7 0
To Oriental Publication Fund, ..	.. ..		11,208 13 9
To Sanskrit Manuscripts Fund, ..	.. ..		3,209 3 0
	Total, ..		44,251 5 11

---

No. 5.  
ments.

## Cr.

			Nominal.			Actual.		
By Balance from last Report,	..	..	1,38,300	0	0	1,37,468	0	0
By Cash,	..	..	10,000	0	0	10,150	0	0
Total, ..			1,48,300	0	0	1,47,618	0	0

By an error of transcription the Dr. figures in Statement No. 5, Investments, have been written on the right side, and the Cr. figures on the left side: they should be transposed.

## Cr.

By Balances from last Report,	{ Blochmann, Memorial Fund,	..	1,268	4	6
	{ Servants' Pension Fund, ..	..	1,007	11	4
Total, ..			2,275	15	10

JOHN C. DOUGLAS,  
Hony. Treasurer, Asiatic Society.

J. WESTLAND, }  
J. SCUNCE, } Auditors.

## No. 7.

## Cr.

EXPENDITURE.								
By Personal account,	..	..	..	..	..	1,339	8	5
By Asiatic Society,	..	..	..	..	..	17,128	12	8
By Oriental Publication Fund,	..	..	..	..	..	7,424	12	5
By Sanskrit Manuscripts Fund,	..	..	..	..	..	3,441	3	6
By Investments,	..	..	..	..	..	10,150	0	0
By Trust Funds,	..	..	..	..	..	1,268	4	6
By Balance, ..	..	..	..	..	..	3,498	12	5
Total,						44,251	5	11

JOHN C. DOUGLAS,  
Hony. Treasurer, Asiatic Society.

J. WESTLAND, }  
J. SCUNCE, } Auditors.

# STATEMENT, No. 8.

## Balance Sheet.

Dr.		Cr.	
To Asiatic Society, ...	1,44,416 14 11	By Personal Account, ...	6,980 5 11
To Sanskrit Manuscripts Fund, ...	2,131 14 2	By Cash, ...	3,498 12 5
To Oriental Publication Fund, ...	10,540 9 11	By Investments, ...	1,47,618 0 0
To Trust Funds, ...	1,007 11 4		
Total, ...	1,58,097 2 4	Total, ...	1,58,097 2 4

Rs.

JOHN C. DOUGLAS,  
Hony. Treasurer, Asiatic Society.

J. WESTLAND,  
J. SCORCE, } Auditors.

NOV 22 1920









